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JOHNSON'S FAMILY PHYSICIAN,

FROM

The Ablest Medical Authorities.

GIVING NUMEROUS AND DANGEROUS DISEASES TO WHICH THE HUMAN RACE IS SUBJECT—
THE SYMPTOMS AND TREATMENT, OR WHAT IS NECESSARY TO BE DONE IN AN EMER-
GENCY FOR THE PATIENT BEFORE THE PHYSICIAN ARRIVES, THEREBY
ALLEVIATING SUFFERING AND OFTEN SAVING LIFE.

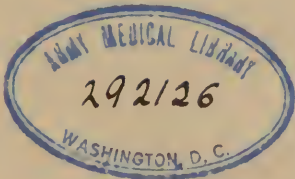
BY

E. DARWIN HUDSON, JR., M. D.

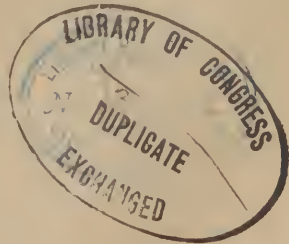
(PROFESSOR OF PRACTICE OF MEDICINE, WOMAN'S MED. COLLEGE OF THE N. Y. INFIRMARY.)

With Articles from the most Eminent Physicians,

AMONG WHOM ARE WILLARD PARKER, ALONZO CLARK, C. R. AGNEW, WILLIAM DETMOLD, ABRAHAM
JACOBI, MARY C. P. JACOBI, STEPHEN SMITH, E. C. SEGUIN, JR., E. KRACKOWIZER, WEIR MITCHELL,
AUSTIN FLINT, W. A. HAMMOND, J. C. DALTON, C. HEITZMANN, C. P. RUSSEL, SAMUEL
ST. JOHN, FREDERICK ZINSSER, F. P. FOSTER, EDWARD CURTIS, DAVID
WEBSTER, G. H. WYNKOOP, ETC., ETC., ETC.



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PREFACE.

THE articles in JOHNSON'S FAMILY PHYSICIAN were prepared by distinguished physicians, whose names in the *Contributors' List* will be recognized as authorities in the profession. They were not written in the cause of "popular medicine"—that is, either to pander to an idle curiosity or passive interest in the mysteries of our body and its ailments—or to educate the public to practise empirically upon themselves. On the contrary, each article was intended to present the essential facts as to some disease or ailment, or allied topic, in the light of the most advanced research of the healing art in our time, and to give to reading and thinking people some conception of the opinions and practices, as regards disease and its treatment, which are recognized by the most prominent teachers and practitioners of medicine. A series of concise accounts of diseases, alphabetically arranged for convenience in consultation, is the result, each detailing the nature and treatment of each disease in much the same way that the educated and friendly physician of the family would detail his views to an intelligent and interested patient competent to understand and appreciate them. Prescriptions and routine methods of treatment are avoided, but the characteristic symptoms of the disease, by which it may be readily recognized, are stated, the methods of diagnosis pointed out, the rationale of the treatment, the special indications to be observed, and the most approved remedies enumerated. In a populous community such knowledge, far from detracting from the patronage of physicians, should increase the public confidence in such as are well qualified, and strengthen the popular faith in the resources of medical science. It is further believed that the methods of treatment herein given, being representative of the views of the profession, will enable the public to detect not only the obsolete practice of those who do not grow in their art, but also the eccentric, pretentious, and unwarrantable methods and deceptions of charlatans, who so often thrive only by the total lack of information on the part of their patrons. But in the rural districts, in sparsely-settled and new countries, the mine and camp, in travel by land and sea, as well as in the exigencies of sudden accident and unforeseen sickness at night, suffering is assuaged or disease or death is often averted by "a little knowledge" on the part of the layman. This work aims to disseminate such knowledge, and details correct instructions which may bridge over the period and danger until the doctor be found. The importance of promptly meeting medical emergencies is well illustrated by their frequent occurrence, and the efficient measures taken in the great capitals of Europe and our own country to meet them. In such cities as London, Paris, and New York, where physicians are numbered by thousands, the instances are numerous where protracted search must be made for physicians busy in their rounds of practice, and death by accident, by poison, or by sudden illness results from the ignorance of friends or bystanders to intelligently do some simple and proper thing. To meet these emergencies "the night medical service" of Paris and other continental cities, and the ambulance system of New York and other American cities, have been devised. The maxim that "a little knowledge is a dangerous thing" has too long been quoted to discourage popular information on technical subjects, and is fast falling into disrepute. The good citizen begins to feel that every division of science has practical bearings on his every-day life and the well-being of the community. The great Dutch physician Boerhaave, in a treatise on the preservation of health, it is said, presented a book of leaves, all blank save one, on which was imprinted, "Keep the feet warm, the head cool, and the bowels open." But since the days of Boerhaave personal safety from pestilence has been vastly increased, the mortality record of every disease has been steadily lowered by means of wise methods of prevention and improved remedies, and human longevity considerably increased, as shown by indisputable figures—contrary to the prevalent misconception that our race is degenerating. The thinking men and women of our day will therefore expect instruction as to these modern means of protection and cure, and recognize the value of some knowledge of the nature of Miasm or Malaria, of Contagious Diseases, the Germ Theory of Disease, of Parasites and Poisons, of Vaccination and Wounds.

Diseases have been treated of under those technical names by which the practising physician usually designates them, but popular synonyms have in numerous instances been introduced to facilitate the reader's search for desired topics.

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AND OTHERS.

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JOHNSON'S HOUSEHOLD TREASURY

OF
USEFUL INFORMATION.

THE FAMILY PHYSICIAN.

Abra'sion. See WOUNDS (contused, etc.).

Ab'scess [Lat. *absces'sus*, from *abs*, "away from," and *ce'do*, to "go," because the pus separates itself from the rest of the body], in surgery, is a circumscribed collection of pus in any part of the animal organism, as distinguished from "purulent infiltration," which designates such a collection not circumscribed. The term "diffuse abscess" is, however, applied, though improperly, to purulent infiltration. An "acute abscess" is one which is the result of active inflammation. "Cold abscess" is the result of chronic inflammation. The tendency of an acute abscess is to "point" or "come to a head;" that is, from the outward pressure of the accumulating pus the walls yield mechanically in the direction of least resistance. In favorable cases the evacuation of the pus, natural or artificial, is the initiation of recovery; but if the abscess be of the "cold" variety, or be deep-seated and extensive, or be associated with symptoms of blood-poisoning, the question of recovery becomes a much more complicated one. The general symptoms of abscess are fever and subsequent rigors; the local are "pain, heat, redness, and swelling," followed by softness and fluctuation of the fluid contents. Abscesses should be poulticed to hasten pointing and evacuation, and to relieve pain when mature they may be evacuated by incision.

Ac'ne. See SKIN DISEASES.

Ad'dison's Disease [named from its discoverer, the late Dr. Addison of Guy's Hospital, London], or **Supra-renal Melasma**, a rather rare disease, the most obvious symptom of which is a gray-black or bronze color of the skin, gradually coming on. The chief lesion discovered after death is a cheesy degeneration of the supra-renal capsules, the result of peculiar chronic inflammation. Patients usually suffer from extreme debility, depression of spirits, pain in the epigastrium

and back, often accompanied by dyspepsia, vomiting, diarrhoea, and grave nervous symptoms. No remedy is known, and the disease, though careful nursing is extremely useful, is probably never cured.

A'gue [probably from the Fr. *agu*, an old form of *aigu*, "sharp," in allusion to the violence of the disease] is the common name for the INTERMITTENT FEVER (which see).

Albuminu'ria [from *albumen* and the Lat. *uri'na*, "urine"] is the presence of albumen in the urine, constituting a very important symptom of disease. Albumen is sometimes observed in small proportion in the urine of persons apparently healthy. Artificial obstruction (by vivisection and ligation) of the emulgent veins in the lower animals produces albuminuria, thus illustrating the fact that passive engorgement of the kidney may cause this symptom, as in organic disease of the heart. Albuminuria has been reported as following the injudicious use of oil of turpentine, in which case it results from an active congestion of the kidney. Albuminuria is sometimes associated with dyspepsia, in which case it may be either a temporary and probably unimportant symptom, or a precursor of Bright's disease—a malady which is among the most formidable of all with which we have to deal. In the latter disease it is chiefly due to two causes—(1) checked perspiration by exposure of the body to cold and wet, and (2) excessive use of alcoholic drinks. This symptom has also been observed in malarial and typhoid fevers, pneumonia, smallpox, scarlet fever, measles, erysipelas, peritonitis, consumption, pregnancy, rheumatism, leucocythæmia, purpura, and a great variety of other conditions. In most cases it results from a degeneration of the kidney, characterized by swelling, opacity, and molecular decay of the renal epithelium.

Albuminuria is detected either by acidulating and boiling the urine in a test-tube

or by adding nitric acid. In either case the albumen coagulates into a white, semi-solid mass. Albuminuria is best treated by attention to hygienic conditions, and diuretics.

Alcoholism. See INTOXICATION.

Alope'cia. See BALDNESS.

Amauro'sis [Gr. *ἀμαύρωσις*, from *ἀμαυρόω*, to "darken"] a term formerly much employed to designate total or partial blindness dependent upon diseases of the optic nerve, either at its origin, in its course, or in the retina; the last-mentioned seat of the disease being by far the most frequent. If the local disease be temporary or functional, the sight will probably be regained, but in the majority of cases there is no such hope. It may arise from many causes, one of the most remarkable of these being the existence of Bright's disease; and in cases resulting from this cause there is an organic change in the structure of the retina, readily discernible by the aid of the ophthalmoscope. Amaurosis sometimes comes on at once, but is generally gradual in its attack. The treatment varies with the extremely various pathological conditions. Active treatment is seldom called for, and no item in the cure of this disease is more important than attention to the hygienic condition.

Anæ'mia [from the Gr. *α*, priv., and *αἷμα*, "blood"], also called **Spanæ'mia** [from *σπανός*, "scarce," "rare," and *αἷμα*, "blood"], a morbid condition of the body in which the blood is of an abnormal composition, there being usually a deficiency in the normal number of red corpuscles, a poverty of albumen, and an excess of salts, the absolute amount of the blood being usually below that observed in health. This condition is not properly a disease, so much as a result of some disease or lesion, such as dyspepsia, hæmorrhage, excessive secretion from any gland or surface, insufficient nutrition, defective aëration of the blood, consumption, cancer, malarial or other slow poisoning, leucocythæmia, excessive labor, or long-continued mental troubles. The symptoms are, first, great debility, paleness of face, lips, and tongue, wasting of the tissues, various cardiac, arterial, and venous murmurs, a small and often rapid pulse, clearness and low specific gravity of the urine. Late in the disease the feet swell and sweating is observed. The treatment is, first, if possible, to remove the cause. Next, the proper conditions for recovery must be established, such as proper food, due exercise, and good air. Tonics, if they are well borne by the patient, are generally useful. Strychnia, quinia, and, above all, iron, are often extremely useful. The iron is generally thought to act as food, there being an actual deficiency of iron in the blood.

Anasar'ca. See DROPSY.

Anchylo'sis. See ANKYLOSIS.

An'eurism [Gr. *ἀνεύρισμα*, a "widening"], a pulsating tumor filled with blood, and communicating more or less directly with an artery, the tunics of which are wholly or partially destroyed. A "true" aneurism has one or more arterial coats in its wall. A "false" aneurism has a wall of condensed areolar tissue, the arterial coat having disappeared. A "traumatic" aneurism originates in a wound or other accidental injury. A "varicose" aneurism communicates with both an artery and a vein, but the term sometimes signifies a mere symmetrical dilatation of an artery. When such dilatations occur in groups or knots, it is a "circoid" aneurism. When the blood gets between the coats of an artery, and thus forms a tumor, it is a "dissecting" aneurism. The heart and its vessels are liable to aneurismal dilatations.

Aneurisms not traumatic are frequently traceable to a degeneration of the arterial coats, known as atheroma. In general, aneurism of the extremities, when sufficiently near the surface, as when it occurs in the "popliteal space" (the hollow of the knee), may be treated with a fair prospect of success by long-continued compression, mechanical or digital. "Ligation," or tying the artery, sometimes succeeds. Galvano-puncture has its advocates as a means of cure. The injection of powerful astringents has succeeded in some cases, but is not to be regarded as a safe proceeding. The prospect, especially in aneurisms of the aorta and its great branches, is that the disease will prove fatal, though there are very infrequent cases which spontaneously recover by the formation of a clot within the tumor, which gradually shrinks into a hard, sometimes a chalky, mass. The administration of sedatives and medicines which increase the proportion of fibrine in the blood has been often advocated. Prolonged fasting has been recommended, but in general the safest way is for the patient to avoid all excesses, and to make use of a nutritious diet, without attempting a cure. One of the most remarkable effects of aneurism is the absorption of neighboring tissues, and even of bones, from the continual pressure. The aneurism sometimes finally bursts internally.

Angi'na Pec'toris ("angina of the breast"), called also **Breast-Pang** and **Heart-Stroke**, an intense pain occurring in paroxysms, and usually commencing in the region of the heart or at the lower end of the breast-bone, and extending along the left arm, more rarely going toward the right side. It is characterized by a feeling of extreme

constriction of the chest, as by a band or cincture, producing a sense of suffocation, faintness, and often apprehension of approaching death. Angina pectoris may be due to organic or functional heart disease. The grave cases result from dilatation and aneurism of the heart or embolism of the arteries of the heart. Functional cases are due to emotional causes and debility. Men over fifty years of age are most frequently attacked. Valerian, aromatic stimulants, morphine, and nitrite of amyl are useful in the attack, which is usually, not always, short. Between paroxysms the patient should lead a tranquil, retired life, and make use of a plain, nutritious diet.

Ankylo'sis, or Anchylosis [from the Gr. ἀγκύλος, "bent"], in surgery, a stiffened and more or less fixed and immovable joint, so called from the crooked position often seen in limbs with such joints. Ankylosis may result from suppurative inflammation, as in "white swelling" of the knee, and is to be regarded as a favorable termination of such disease. These cases result often in neoplastic exudations—new tissues—adhering to the cartilages of both articulating bones; and not unfrequently these new growths are partly or completely ossified, converting the two bones into one. The cartilages or ligaments of a joint may become shrunken from disease, the opposing synovial membranes may adhere to each other, or other important structural changes may prevent motion. "Spurious ankylosis" is a case in which a spasm or cicatricial contraction of the muscles, or even of the skin, prevents motion, while the joint itself is not the seat of disease. Cases of so-called hysteria sometimes are accompanied by a stiffness of one or more joints; but such cases are readily detected after the administration of an anæsthetic, when the joint at once becomes movable.

The prospect of recovery of motion in an ankylosed joint is small indeed. Joints stiffened at an inconvenient angle may be put into better shape during anæsthesia, and then be allowed to become ankylosed again in the desired position. Excision of joints has been considerably practised, and with some success as a means of cure.

Anthelmin'tics [Gr. ἀντί, "against," and ἔλμινς, a "worm"] are medicines which either destroy or drive out intestinal parasites; the former are called vermicides, the latter vermifuges. The last named are most commonly employed. Against the ordinary lumbricoid worm (*Ascaris lumbricoides*), or round-worm, an infusion or fluid extract of senna and spigelia (pink-root) is safe and efficacious. To drive out the worrying seat-worms or thread-worms (*Oxyurus* or *Ascaris*

vermicularis) nothing is better than santonin, introduced into the bowels in the form of a suppository. For the more formidable tape-worm (*Tenia*) carbohc acid, oil of turpentine, oil of fern, kousso, pumpkin-seeds, and pomegranate-seeds are used. It is important that the head of the tape-worm shall pass away, as, till that happens, the joints continue to be reproduced.

An'thrax. See CARBUNCLE.

Apho'nia (loss of voice) may be (1) nervous aphonia, temporary and cured by time, rest, tonics, and electricity, or (2) aphonia due to disease of the vocal cords. (See THROAT, DISEASES OF.)

Aph'thæ. See MOUTH, DISEASES OF.

Ap'oplexy [Lat. *apoplexia*, from the Gr. ἀπό, "away," and πλῆσσω, to "strike;" as we speak of a *stroke* of apoplexy or of paralysis], a disease marked by the sudden failure of volition, sensation, motion, and mental action, the symptoms being caused by a pressure upon the brain originating within the cranium. Apoplexy is of various kinds, differing not so much in symptoms as in pathology. The typical form is characterized by an escape of blood into the substance of the brain from a ruptured vessel. The rupture itself may be caused (1) by a non-inflammatory, fatty degeneration of the blood-vessel, caused by bad nutrition, etc.; (2) by a brittle condition of the vessel, resulting from an inflammatory process. These causes may be supplemented by a full habit of body or by a hypertrophied heart, or both; and it is easy to see how such secondary causes might assist in the rupture of a weakened blood-vessel. Apoplexy may, however, be produced by an extravasation of blood between the membranes, by a sudden and large serous effusion into the ventricles of the brain, or even by a congestion (hyperæmia) of the brain. The apoplectic stroke may end in partial recovery or in speedy death. Cases not fatal generally result in permanent or temporary paralysis of one side of the body (hemiplegia), usually on the side opposite that in which the mischief has occurred.

The symptoms of apoplexy are often unexpected. The patient falls suddenly (with or without an outcry), his respirations are long, slow, and stertorous, the pulse is slow, one or both the pupils usually small. If the patient does not die during the attack, a secondary inflammation follows which may destroy life. Bleeding may be resorted to if the pulse be strong and the heart and lungs in good condition, but it is often injurious. Mustard to the extremities and frictions of the skin should be resorted to, and the bowels should be moved by enema. Persons having reason to fear apoplexy

should avoid excesses of all kinds, yet live upon nutritious food, paying special attention to hygienic conditions.

Arthri'tis. See RHEUMATISM and SYNOVITIS.

Arthri'tis Deformans. See RHEUMATISM.

As'caris [Gr. *ἄσκαρις*], (plu. *Ascar'ides*), a genus of intestinal parasites, of which the most common is the round-worm, *Ascaris lumbricoides*, found in the intestines of man. Children frequently have them, principally in the small intestines. The body of this worm is round, elastic, with a smooth surface, of a whitish or yellowish color; it tapers especially towards the anterior extremity, which commences abruptly by three tubercles which surround the mouth. The body is transversely furrowed with numerous fine lines, and marked also with four lines from head to tail. In the female there is usually a constriction of the body at the distance of about one-third of its length from the mouth. Sometimes, especially in young and weakly children, their accumulation may cause serious disturbance; even convulsions may be thus produced. There are no symptoms (apart from the passage of the worms from the bowels) invariably connected with their presence. Itching of the nose, capricious appetite, swelling of the abdomen, and grinding the teeth when asleep, may all occur, but they may also be produced by other causes. *Ascaris vermicularis* is the small white thread-worm or seat-worm, which, although called *ἄσκαρις* by Hippocrates, is by most recent writers called *Oxyuris vermicularis*. Its length is from two-twelfths to five-twelfths of an inch, the female being larger than the male. The head is blunt, widening on each side; the body tapers (at least in the female) to a point. Seat-worms, by the itching they produce, often distress children very much; they are less frequently met with in adults. (For treatment of worms, see ANTHELMINTICS.)

Asci'tes [from the Gr. *ἄσκος*, a "skin," a leathern bag for water, alluding to the shape of the patient's abdomen], dropsy of the abdominal cavity, is most frequently an indication of portal obstruction, caused by "cirrhosis" or other disease of the liver, which hinders the return of venous blood to the heart and causes pressure in the veins, leading to transudation of serum into the peritoneal (abdominal) cavity. In other cases it is a symptom of general dropsy; or it may result from cancer or tubercle of the peritoneum; or, in children especially, it may appear as a temporary and quite inexplicable phenomenon, without serious danger or distress. Ascites must be regarded in almost all cases as very grave; in a few cases the immediate danger passes away for

the time; but such results are temporary and unfrequent. The treatment is palliative. Diuretics may be useful, but hydragogue cathartics are much more effective in relieving the symptom. Tapping may be practised where the dropsy very seriously distends the abdomen. The diagnosis between ascites and ovarian dropsy is sometimes very difficult. The distinctive marks can be appreciated only by the skilled physician.

Asphyx'ia [from the Gr. *α*, priv., and *σφίξις*, the "pulse"], originally meaning cessation of the motion of the heart, has by usage come to signify arrest of breathing (properly *apnoea*) by suffocation or strangulation. It occurs in drowning, by water excluding air from the lungs; in hanging or choking, by the compression of the windpipe, preventing the entrance of air; in the presence of certain gases, as chlorine or pure carbonic acid, by spasmodic closure of the glottis or entrance to the windpipe. It has been proved by careful observations that after death by asphyxia the left cavities of the heart are empty, and the right distended with blood. This is owing to the fact that venous blood, not renewed by exposure to the oxygen of the air, will not circulate through the lungs, thus being forced to accumulate in the right or venous side of the heart. The mode of treatment of asphyxia must depend on its cause. (See DROWNING.) In partial strangulation, abstraction of blood in moderate amount may unload the heart and promote the movement of the blood, after the cause of obstruction has been removed. For asphyxia from irrespirable gases the first necessity is a supply of pure air. When the heart has almost or quite ceased to beat for a few moments, life is sometimes restored by artificial respiration or by application of galvanic electricity to the chest.

Asth'ma, *az'ma* [Gr. *ἄσθμα*, a "gasping for breath"], a term somewhat vaguely used to designate diseases characterized by difficulty of breathing occurring in paroxysms; thus, spasm of the glottis is sometimes called "thymic asthma;" autumnal catarrh is known as "hay asthma;" the dyspnoea (difficult breathing) of Bright's disease has been, with questionable propriety, called "uræmic asthma;" and similar symptoms arising from heart or lung disease have also been mistaken for true asthma, which, however, may be associated with these various diseases. True asthma, according to Niemeyer, includes only those cases where the point of the irritation producing the attack is either at the origin of the vagus nerve or in some remote part of its course. This does not exclude cases of reflex asthma, such, for

example, as may occur in uterine disease. Others state that irritability and congestion of the bronchial mucous membrane are essential elements of the disease; and the readiness with which powdered ipecac., the exhalations from feathers, etc., will excite paroxysms, would appear to confirm this view. It is rare to find structural changes of any organ in cases of simple asthma. The trained diagnostician alone can discriminate between asthma and dyspnoea from other chest diseases. True or nervous asthma consists in a paroxysmal spasm of longer or shorter duration, attacking the muscular elements of the bronchial tubes, diminishing temporarily their calibre, and thereby obstructing respiration. Notwithstanding the great distress which may accompany the attack, the immediate danger is not great. The smoking of saltpetre-paper or of stramonium-leaves, the administration of opiates, coffee, belladonna, conium, cannabis, chloral, vapor of chloroform, etc., may or may not relieve the paroxysm. Iodide of potassium benefits many cases, permanently or temporarily. Quinia, Fowler's solution, iron, and other tonics are often useful. A nutritious diet, with careful regulation of the bowels, is important. The compressed air-bath and inhalation of oxygen are recommended as affording great relief during the paroxysm. Asthma in many cases is accompanied by a bronchial catarrh.

Astig'matism. See EYE, DISEASES OF.

Atax'ia. See SPINE, DISEASES OF.

Auscul'tation, application of the ear to the surface of the body, chiefly to the chest for the detection of the healthy and diseased sounds of the heart and lungs.

Bald'ness (*alopecia*), [Gr. ἀλωπηξ, a "fox," this animal being subject to baldness]. Loss of hair may be either general or partial, sudden or gradual. It occurs in men more often than in women. Senile baldness, the result of age, comes on gradually, the hair becoming thin on the crown or on the temples and forehead. It results from loss of nutritive activity of the hair-follicles, which atrophy and render the loss irreparable. When baldness follows severe sickness, or results prematurely from constitutional debility or nervous shock and overwork, the hair-follicles are intact though inert, and may be stimulated to new activity by tonic applications. Rest, regular habits, good diet, cod-liver oil, iron, and tonics generally, by invigorating the system, favor the regrowth of the hair. The capillary circulation of the scalp must be stimulated by shampooing, kneading, brushing, and by the use of lotions which irritate without stimulating. Cantharides and am-

monia, in union with oils or unguents, are very efficacious in curing baldness.

Ban'dages [from the Anglo-Saxon *bin'dan*, to "bind;" literally, anything used for binding], the bands or wrappers used by surgeons to dress wounds, to compress bleeding vessels, to rectify the deformity produced by fractures or other injuries, and to unite parts in which there is a solution of continuity. They are commonly composed of soft muslin, linen, or flannel. Sometimes they are made immovable after application by being soaked in starch or glue. The art of bandaging consists in applying pressure with exactly the required firmness, and *evenly*. It is important to avoid interrupting the circulation of the blood. Unskilful bandaging has caused mortification of a limb. The arm should never be tightly bandaged (unless temporarily, to arrest hæmorrhage) without the hand being subjected to an equal amount of pressure; and the same rule applies with regard to the leg and foot. To make a bandage fit well upon a limb, the roller should be drawn smoothly as far as it can be, and then *reversed* by a turn of the hand from time to time, producing a spiral by the overlapping of the successive turns. A bandage for the arm may be from two to two and a quarter inches wide; for the lower extremity, two and a half inches; for the chest, three inches. In the treatment of wounds, however, and of stumps of amputated limbs, bandages are less resorted to now than formerly, many surgeons preferring lighter and cooler dressings, with adhesive strips, etc. One of the most useful of bandages for emergencies is the "Spanish windlass," to check serious bleeding from any part of either extremity. It is merely a strip of muslin or a pocket handkerchief passed around the upper part of the limb, tied in a knot, and then twisted firmly by a stick or bayonet passed under it, so as to press with sufficient force to arrest the arterial circulation. It must not be left on many hours, but its temporary application has often saved life. In like manner, free bleeding from a wound of the scalp may be controlled by a compress and bandage tightly applied around the head. Esmarch's bandage is an elastic ribbon of rubber for application to the arm or leg before amputation or other serious operations. By its compression the blood of the member is expelled upwards into the vessels of the body, and the operation is rendered "bloodless." Rubber bandages are also used with brilliant results in treating ulcers and varicose veins and reducing dropsical swelling in the legs.

Dextrine or starch bandages, the plaster-of-Paris bandage, and water-glass bandage

are now applied most successfully in the treatment of fractures of the bones of the extremities, in place of other splints. The starch or dextrine bandage is made by saturating several successive layers of carefully-applied bandage, or cloth of loose texture, with thick boiled starch, which when dried converts the soft fabrics into a rigid case. The plaster of Paris or gypsum is prepared by making a thin paste of equal parts of plaster and water, which may be soaked into the bandages or cloths fitted to the shape of the broken limb. Salt added to the water hastens the "setting" of the plaster. Glue is added where the setting is desired to be slow. The water-glass or silicate bandage is made of silicate of potash or silicate of soda dissolved in caustic potash or soda. It possesses great strength, and is very light. Each layer of the roller bandage as it is applied is brushed over with the solution of the silicate, which at once dries. A final coating secures the smooth dressing for the exterior.

Barba'does Leg. See ELEPHANTIASIS.

Bar'ber's Itch, a term applied somewhat indiscriminately by the public and many physicians to two distinct diseases.

1. A majority of cases are instances of *impetigo mentis*, or pustular eruption on the face from the irritation of too frequent and close shaving. The face is inflamed, red, tender, and nodular, with numerous pustules of various size, discharging pus, which mats in the stumps of the beard and forms scabs. But the beard does not fall, and if isolated hairs be pulled out and the bulb examined microscopically, it is found to be free from any of the parasitic sporules which mark the second and contagious form.

2. The second form is the true "barber's itch," contracted by contact of person or the soiled and contaminated razors and brushes of the barber. It is termed *sycosis*, *tinea sycosis*, and *mentagra*, and is really "ringworm in the beard." Each hair of the infected beard is covered with a whitish powder of parasitic scales or sporules. The parasitic vegetation is the *Microsporon mentagrophytes*, probably identical with the *Tricophyton tonsurans* of simple ringworm. The face is variably inflamed with nodules of hardening and pustules, and has patches and arcs of whitish scales. In either the *impetigo mentis* or the true *sycosis* the inflammation is to be removed by frequent applications of cold water, perfect cleanliness, and soothing lotions, as of glycerine, opium, and acetate of lead. With the first form such methods will suffice. In the second or parasitic form all the infected hairs should be pulled out with the depilation-forceps, and the parasites destroyed in the

hair-follicles by "parasiticide" lotions or unguents. Chief of these are sulphurous acid, either pure or diluted, carbolic acid in glycerine, weak solutions of corrosive sublimate, and ointments of sulphur, iodide of sulphur, nitrate of mercury, and white precipitate.

Basedow's Disease, called also **Graves' Disease** and **Exophthalmic Goitre**, is a disease more common among women than men, and characterized by prominent eyeballs, slightly enlarged thyroid gland, palpitation of the heart, and generally by anæmia. Basedow's disease frequently, though not always, ends in recovery. Its cause is stated by Niemeyer to be probably a paralysis of the vasomotor nerves. It is best treated by good food, chalybeates, gentle exercise, and hygienic measures.

Bil'ious Col'ic and Cal'culus. See LIVER, DISEASES OF.

Bil'ious Fe'ver, an indefinite term not included in any accepted classification of disease. It is equally applied to attacks of extreme indigestion with associated irritative fever (*febricula*); to the disturbance of persistent constipation and torpid liver, when fever coexists with headache, foul tongue, bad breath, loss of appetite, loaded bowels, general languor, and chilliness; to obscure forms of malarial fever (remittent); to unpronounced and mild cases of typhoid; and to many other cases when the physician lacks in diagnostic ability. The cases which may be termed bilious fever are such as are due to inactive liver, costiveness, and disordered digestion, and marked by chills, general malaise, and dark complexion, but yield promptly to a vigorous cathartic treatment and corrected diet.

Birth-marks. See NÆVUS.

Bites of Serpents. See POISON OF SERPENTS.

Blad'der [Lat. *vesica*; Fr. *vessie*], a musculo-membranous sac contained in the anterior part of the pelvis. It is absent in all invertebrate animals. A few cartilaginous fishes possess it; so do Batrachia (frogs, etc.) and Chelonina (turtles). No birds have it, although the ostrich and cassowary have a dilatation of the cloaca somewhat resembling it. It is present in all Mammalia. In man the bladder is nearly triangular when empty, oval when full. The ureters (one on each side) convey the urine to it from the kidneys; and this is voided, by the contraction of the bladder, through the urethra. The entrance to the latter is guarded by a valve, partly muscular, called by some anatomists the *sphincter vesicæ*. Distension of the bladder (retention of urine) from any obstruction of the urethra is a very painful and sometimes

dangerous affection. It may be spasmodic, but it is more often the effect of a stricture or contraction of the passage from local disease. In low fevers it is not uncommon for a kind of paralytic distension of the bladder to occur. In either of these cases the removal of the urine by means of a catheter is of great importance. The bladder is also liable to inflammation (see CYSTITIS) and to chronic irritability, either of which may cause great distress. (For stone in the bladder see CALCULUS.)

Bleed'ing, or Hæm'orrhage [from the Gr. *αἷμα*, "blood," and *ῥέω*, to "flow"], in surgery, denotes the escape of blood from the vessels which normally contain it. When the escape takes place into the tissues it is called "extravasation." Hæmorrhage into an internal cavity is said to be "concealed." A slight cut through the integument is usually followed by loss of blood, chiefly from the capillaries. Capillary bleeding will in many cases cease spontaneously, or it may require compression or the application of medicines, such as persulphate of iron or tannic acid. These medicines are called hæmostatics or styptics. Arterial bleeding is recognized by the fact that the blood escapes in jets and is of a bright-red color. Arterial bleeding tends spontaneously to grow less, both from the feebleness of the heart's action which naturally follows, and from the retraction and contraction of the arterial walls, and the consequent formation of a clot of blood, which plugs the wound; but it may be necessary to resort to ligation or tying, to acupressure or compression of the artery by needles, or to pressure, mechanical or by hand, upon the course of the artery between the heart and the wound. A handkerchief may be tied around and then twisted with a stick. The wounded part should be elevated if possible. Venous bleeding is not generally very formidable. It may be recognized by the steady flow of dark blood. A great source of danger when large veins are cut is that air may enter the circulation; in which case death may immediately follow.

Hæmorrhage from an internal and inaccessible surface may be treated by astringents, as gallic acid, or by ergot, which is especially important in puerperal hæmorrhage. Some individuals have what is known as the hæmorrhagic diathesis—a disposition to bleed excessively even after a slight injury. A tendency to hæmorrhage from the mucous surfaces is characteristic of some diseases, such as typhoid fever.

Bleed'ing, or Blood-letting, the abstraction of blood from the circulation as a means of curing or preventing disease. This operation is performed either by opening a vein (venesection or phlebotomy), by abstraction from

the capillaries by means of leeches or cups, or more rarely by opening an artery (arteriotomy). Bleeding was formerly in extensive use in the treatment of many diseases, generally of an acute or active character; and though it has to a great extent been superseded by other measures, of late years it has been attracting the attention of the medical profession as a valuable therapeutic measure in a certain limited class of diseases. While it is liable to abuse, and while, like many other active measures in the treatment of disease, it may become a source of mischief, it is nevertheless, when used with judgment, a valuable help in the treatment of some disorders.

Blennorrhœ'a [Gr. *βλέννα*, "mucous," and *ῥέω*, to "flow"], an abnormally copious discharge from any mucous membrane. After inflammation of the urinary mucous membrane a gleet discharge frequently continues for a long period (*gleet*). Tonics, fresh air, careful regimen, and astringent lotions are the remedies.

Blind'ness is caused by diseases and injuries of the eye-ball or the optic nerve. Opacity of the cornea, cataract, inflammation of the retina, and sclerotina and amaurosis are its chief causes. The curability of blindness depends upon the disease causing it. (See EYE, DISEASES OF.)

Blis'ters are plasters which, when applied to the skin, raise the cuticle into vesicles filled with serous fluid. They have for their object a counter-irritation or diversion of inflammatory action from an internal part to the surface of the body. The common blister is made of cantharides or Spanish fly (*Cantharis* or *Lytta vesicatoria*), mixed with a convenient proportion of lard and wax. If applied too long it produces distressing affections of the urinary bladder. In children and sensitive persons a layer of thin gauze may be placed between the blister and the skin. Under no circumstances should a blister be left long upon children, as it may produce sores which are difficult to heal. When the blister has raised, the vesicles should be pricked and their fluid contents allowed to trickle away, the vesicated surface being then dressed with simple cerate or lard.

Blood, Spit'ting of. See HÆMOPTYSIS.

Blood, Vom'iting of. See HÆMATEME-SIS.

Blood'y Flux. See DYSENTERY.

Boil [Lat. *furunculus*], a hard, painful, inflammatory tumor on the surface of the body, which begins as a point of a dusky red color, and is hot, aching, and throbbing. These symptoms increase in severity for several days, when it is of a conical form, with a broad firm base, and has on the apex

a whitish point, which contains a little matter; this opens and after a few days more there is discharged a slough of cellular tissue, and the cavity left heals, leaving a depressed scar. Boils often attack young and plethoric persons, and their appearance is not incompatible with robust health, although they may be so numerous as to greatly reduce the strength. Men in training for athletic exercises, or others who have suddenly changed their habits, are subject to them. Sometimes boils continue to succeed each other for a length of time. The treatment of boils is simple. The intestinal canal should be cleared by laxative medicines, and the digestive powers improved by tonics and antacids. The tincture of perchloride of iron is often a useful remedy. The skin should be kept healthy by frequent washing, while the inflamed point should be poulticed. Wet lint is a sufficient application after the core has been thrown off. Free incision of the boil greatly hastens its course.

Brain, Diseases of. See BRAIN FEVER (meningitis), APOPLEXY, and NERVOUS DISEASES; also, CONCUSSION OF THE BRAIN.

Brain Fever is a popular name for acute cephalic meningitis (see MENINGITIS), a dangerous disease, characterized in its earlier stages by very high fever and intense headache, usually followed by delirium and death. Inflammation of the brain itself (encephalitis) is less common, but is even more fatal than the former. It is not always easy to discriminate between the two during life. Cold applications to the head and mild but persistent derivative treatment are generally indicated.

Breast, Abscess of, chiefly arising from overloading of the breast with milk, following childbirth. It is best prevented by a brisk purge, quinine, and febrifuges, and the unloading of the breast by the nursing infant, the breast-pump, thorough rubbing, and inunctions of warm camphorated oil. When abscess is formed it must be poulticed or incised.

Bright's Disease (or *Ne'phria*), so called after the English physician, Dr. Bright, who first investigated its character, consists essentially of a degeneration of epithelium of the kidneys. This impairs the excreting powers of the organ, so that the urea is not properly removed from the blood. The disease is characterized by albuminuria. When we apply heat and nitric acid to the urine from a kidney so affected, albumen is coagulated; under the microscope we observe casts of the tubules of the diseased organ. Headache and sickness of stomach are common symptoms, and dropsy usually

attends the disease. The retina is usually attacked by a degenerative inflammatory disease, which impairs the sight, and is detected by the ophthalmoscope.

The causes are, indulgence in strong drinks, exposure to wet and cold, gout, and syphilis. The indications for treatment are, to remove any of those causes which may be present, relieve congestion of the kidneys, at the same time endeavoring to increase strength by iron and other tonics. When considerable dropsy occurs, cathartics may be called for. Bright's disease may be either acute or chronic. The prospect of recovery is small, but patients sometimes attain a comfortable, but generally a precarious, degree of health.

Bro'ken Bones. See FRACTURE.

Bro'ken Breast. See BREAST, ABSCESS OF.

Bronch'itis [from *bronchus*, and *-itis*,] inflammation or hyperæmia (congestion) of the mucous membrane lining the air-passages, and usually accompanied by a more or less excessive secretion of mucus from that membrane. Young children, old people, and those who are feeble or ill-nourished are especially liable to it. More or less bronchitis is usually associated with pulmonary consumption, with obstructive heart disease, and with asthma. It is often seen in patients with intermittent fever, typhoid, measles, and smallpox. Perhaps the most fruitful cause is exposure to sudden and extreme changes of the weather, leading primarily to that form of acute bronchitis which is known as a "cold on the lungs." Influenza is an epidemic bronchitis caused by some unknown influence probably existing in the air. (See INFLUENZA.)

The symptoms of bronchitis are of various character, varying according as the disease is seated in the larger or the smaller bronchi; the disease is also much more formidable in young children and in aged persons than in others. There is especial danger in the case of infants that collapse of small portions of the lung may ensue. Bronchitis may be either chronic or acute. Uncomplicated chronic bronchitis may require the use of sedatives or tonics, with systematic exercise and careful attention to the other hygienic conditions, but the treatment of individual cases will vary with the circumstances and special condition of the patient. Acute bronchitis is in general to be treated by expectorants or emetics, to remove the secretion, and by diaphoretics and counter-irritants, such as mustard, on the extremities and the chest, to relieve the congested blood-vessels of the bronchi. When the case is extreme and suffocation threatened, an infant may be often relieved by a warm bath. There are other special reme-

dial measures which may be resorted to under the advice of the physician.

Bron'chocele. See GOITRE.

Bruises. See WOUNDS (contused).

Bunion, or Bunyon, a painful inflammation of the *bursa mucosa*, or membranous sac of the great-toe joint. The pressure of a boot causes it. Rest and poulticing will generally subdue the attack, and wearing a shoe so constructed as to save the bunion from pressure will usually prevent a recurrence.

Burns and Scalds. Burns arise from the application of a hot solid body or flame, and scalds from hot water or steam. Severe burns are often fatal, especially to children; quite as much, perhaps, from the shock which attends them as from any appreciable injury. In all cases the clothes should be removed with great care, so as not to remove the cuticle with them. If cold water be agreeable to the patient, it may be cautiously applied. Pain and shock may often be relieved by opiates or stimulants. The injured surfaces are to be dressed with caron oil (a mixture of olive oil and lime-water), with collodion, with oiled cotton, or they may simply have flour dredged over them. When the surface takes on an unhealthy action and granulations are excessive, a weak solution of nitrate of silver or other local stimulant may produce good results.

Cal'culus, or Stone, a concretion formed within the body from the deposition of matters which normally remain in solution. The most important calculi are those formed in the kidneys or bladder (urinary calculus), and those formed in the gall-bladder or biliary ducts (biliary calculus, or gall-stone). Both of these give rise to intense pain, and may even threaten life. Calculi of less importance may form in the salivary ducts and elsewhere.

Biliary calculus may generally be assumed to exist when excessive pain suddenly arises in the right side beneath the ribs, and when in a few hours jaundice comes on. But absolute proof that these symptoms depend on calculus is often wanting. The pain is more severe while it lasts than almost any other form of suffering. It may be relieved by large doses of opium or by the inhalation of ether. Gall-stones impacted in the ducts sometimes have proved fatal, but much more frequently they find their way, sooner or later, into the intestines.

Urinary calculus is a disease most common in advanced life and in the male sex. It is frequent in gouty persons, or among those who pursue sedentary occupations and live freely. Certain local conditions promote it, especially an excess of mineral

matter in drinking-water. It is common in England, Ireland, Russia, France, Northern Italy, and Egypt. In the U. S. it is most frequent in Kentucky, Tennessee, West Virginia, Ohio, and Indiana. In its early stages the disease presents itself in the form of gravel, shown by the passage of numerous small gritty concretions, observed in the urine as a deposit like sand, present at the time of passing the urine, and not merely after it has cooled. Calculus in the bladder is at first attended with little pain, as compared with that caused by the stone in its passage downward from the kidney; but unless removed the calculus is sure to enlarge, and it then becomes the cause of most intense distress. The most trustworthy evidences of stone in the bladder are the use of the sound, smarting and burning pain experienced after the bladder has been emptied, with occasional temporary stoppages of the urine.

The chief varieties of urinary calculus are—1. Uric acid, urates of ammonia, soda, lime, etc. (brick-dust sediment, red sand); 2. Phosphates of ammonia and magnesia, lime, etc. (the lime phosphate, mixed with ammonio-magnesian phosphate, constitutes the "fusible calculus," one of the commonest kinds); 3. Oxalate of lime (mulberry calculus); 4. Carbonate of lime (chiefly in domestic animals); 5. Cystine; 6. Xanthic oxide (very rare); 7. Very rarely indeed do leucine, tyrosine, and other disease-products form calculous concretions. 8. Calculi of fibrine, etc. are also reported. 9. Calculi are frequently composed of numerous layers, having perfectly distinct chemical composition. When calculus has once formed in the urinary organs no cure exists except the removal of it from the body, but in the earlier stages much may be done to check the malady by careful regulation of the diet and mode of living, with the use of solvents adapted to the particular form of deposit found.

Can'cer [from the Lat. *cancer*, a "crab," the swollen veins around it being likened to crabs' claws], the popular name for carcinoma, a disease characterized by tumors or slow ulcerations in various parts, having a malignant character, and usually ending in death.

Among the tumors admitted by general consent into the order of cancers there are widely different degrees of malignancy; some having the tendency to spread rapidly and infect the system at an early period, while others remain local for a considerable time, and may be removed with good hope of a permanent recovery.

The practical distinction or *diagnosis* of these tumors is founded upon a careful com-

parison of the characters of malignant and non-malignant tumors, and also upon a thorough knowledge of the anatomy and relations of the textures in which they arise. The attempts to distinguish these from other growths call for the highest qualities of the surgeon, including a knowledge of minute structure as obtained by the use of the microscope.

The most common seats of cancer are, the female breast, the eye, the tongue, the lip, the male genital organs; the liver, stomach, uterus, rectum, gullet, peritoneum, and lymphatic glands. Scirrhus or hard cancer, observed most frequently in the breast, uterus, and stomach, is more frequently solitary than encephaloid (brain-like), otherwise called medullary or soft cancer; the rare colloid cancer is of a glue-like consistency; melanosis, or melanic cancer, a variety charged with brown or black pigment, is almost always multiple in its occurrence; while epithelial cancer, or epithelioma, of which examples are frequently found in the lip and tongue, is so generally solitary as to have led some pathologists to place it in a class altogether apart from the truly cancerous growths. Again, there are varieties of fibrous and of cartilaginous tumor, as well as certain tumors of bone and bone-like tumors in soft parts (osteoid), which occupy a doubtful position between the malignant and non-malignant growths, the so-called "cauliflower excrescence" being one of the number.

A tumor falls under the suspicion of being cancer when it infiltrates the texture in which it arises and passes into the surrounding textures; when it invades the lymphatic glands; when it is attended by stinging or darting pains, or by obstinate and slowly extending ulceration; when it occurs in a person having impaired health or past middle life, and is not traceable to any known cause of inflammatory disease or local irritation, nor to any other known constitutional disease, such as syphilis or scrofula. But the elements of diagnosis here referred to ought to be early submitted to the scrutiny and judgment of a well-educated medical adviser.

The removal of cancerous tumors is resorted to by surgeons, and when performed early in well-selected cases it has been followed by long-continued exemption. Operations are rarely performed after the lymphatic glands are involved, or when there is evidence of a deteriorated constitution or of internal disease.

Can'crum O'ris (synonyms, *noma*, *aqueous cancer*), a mortification of the cheek, mostly in children who have long suffered from poverty, moist or close air, or fever. The

proximate cause is generally found in an imprudent administration of mercury, or in the inanition and dissolution of the blood from measles, typhoid fever, whooping cough, or dysentery. It is almost always fatal. When the malady is developed the diseased portion must be disinfected by permanganate of potassa or carbolic acid, or destroyed by concentrated mineral acids, chloride of zinc, arsenic paste, or the red-hot iron. The general condition of the patient requires a generous diet, and the administration of stimulants and iron, or quinia, or both combined.

Can'ker in the Mouth. See MOUTH, DISEASES OF.

Car'buncle [Lat. *carbunculus*, a "small coal"], the *anthrax* of surgical writers, is a violent and painful inflammation, larger than a boil, on any part of the skin, most frequently on the back. The part swells and hardens, and, as the disease advances, assumes a livid redness. The cuticle often rises in blisters, and a number of small openings may occur, through which matter escapes. The origin of carbuncle seems to be constitutional, and it is usually attended by great suffering and considerable prostration. It is sometimes fatal, especially to old people. In its treatment, besides supporting the patient's strength and softening the skin by warm poultices, it is usual to divide the skin early and freely with a knife, or to destroy its surface with caustic.

Carcino'ma. See CANCER.

Cardial'gia, or **Car'dialgy** [from καρδία, the "heart," and άλγος, "pain"], literally, "pain in the heart." The term is commonly applied, however, to the uneasiness (heartburn) connected with indigestion, the seat of which is really in the stomach. Relieved by bicarbonate of soda, bismuth, and guarded diet. (See INDIGESTION.)

Cardi'tis, inflammation of the heart. See ENDOCARDITIS and PERICARDITIS.

Ca'ries, a term used to designate both open ulcer of bone and chronic osteitis or inflammation of the connective tissue of bone, with solution of the earthy part. It begins as an inflammation, accompanied by periostitis, followed by exudation of new materials and softening. Sometimes the bone-cells are filled with a reddish fluid, and there are masses of tubercle. After caries has existed for some time the abscess bursts; its aperture remains open, discharging a fluid which contains particles of bone. If a probe be passed through this opening, it will be felt to sink into a soft, gritty substance; this is carious bone. It is molecular death of bone, while necrosis is death of a large mass of bone.

Caries usually selects the vertebrae, the bones of the wrist and foot, and the soft

ends of long bones forming joints. Carious vertebræ yield under the weight of the trunk, and the spine curves forward or to one side. In joints the part enlarges, the cartilages become affected, matter forms, and amputation of the limb or excision of the joint is frequently necessary. The causes of caries are constitutional, such as bad nutrition, syphilis, old age, and other depressing conditions. It may be accidentally determined by any irritation, such as a blow or exposure to atmospheric changes. The treatment consists in supporting the patient by judicious change of air, by the use of tonics, such as cod-liver oil, which in scrofula appears to combat the constitutional predisposition. In those parts where the diseased bone can be reached it may be carefully removed, so as to leave a healthy surface.

Caries of the teeth is a very common disease. It is believed to be caused by dyspepsia and the use of too hot food and drink, but especially by neglect to clean the teeth after eating.

Cat'alepsy [from the Gr. *κατά*, intensive, and *λαμβάνω*, to "take"], a condition in which a person becomes more or less completely unconscious, but does not fall. If standing at the commencement, he remains so during the attack, the countenance retaining the expression the patient wore at the outset. If the limbs of the patient be placed in a new position by attendants, the position is retained. This disease is a rare one, and indeed is probably not so much a peculiar disease as a symptom of other diseases. It has been observed in both sexes, and may occur in insane persons or in those suffering with chorea and other nervous affections. The attack is usually short, but may be indefinitely prolonged. Treatment must be addressed to the general condition. Catalepsy is so rare that its character is not well understood.

Cat'aract [Gr. *καταρράκτης*, from *κατά*, "down," and *ρήγνυμι*, to "break," so named because the ancients believed that a kind of veil fell down within the eye, obscuring vision], an opaque state of the crystalline lens of the eye, of its capsule, or both. Cataracts are thus lenticular, capsular, or lenticulo-capsular. Various other kinds are enumerated, such as the soft cataract, in which the lens is soft, and sometimes even liquid; the hard cataract, when the lens may be as hard as bone, with many of intermediate consistency. Lamellar cataract affects a limited part of one or more of the lamellæ, or layers of the lens. "Gold-leaf cataract" is of a shining yellow, and contains cholesterine and crystalline degeneration-products. Cataract is generally white,

but sometimes is brown, black, bluish, silvery, etc. It sometimes has a pearly lustre.

Cataract begins in a gradual impairment of vision, some months generally elapsing before sight is lost. The pupil is sensitive to light and atropia, vision being clearest when the pupil is large. There is no pain or intolerance of light. The patient sees as in a mist, but almost always can perceive at least the presence of light. The pupil on examination is seen to be opaque, but the eye is neither hardened nor softened, and the expression of the face is quite natural. One or both eyes may have cataract. It is most frequent in elderly persons, but may occur at any age; children are sometimes born with it. Medical treatment for cataract is useless, but the skilful surgeon can treat the disease often with the happiest results. The operation is either (1) extraction of the lens and its capsule, (2) depression or couching of the same, or (3) laceration with appropriate instruments, with a view of inducing absorption of the diseased part. This last operation is the most common, and often is the only one admissible. Great care should be taken for a long time to prevent inflammatory action. The place of the lens is supplied by a kind of spectacles called cataract glasses. By these means the sight is often to a great degree restored.

Catarrh' [from the Gr. *κατά*, "down," and *ῥέω*, to "flow"], in medical language is a condition characterized by hyperæmia (or congestion) of the blood-vessels of any mucous surface, with great increase of the proper secretion of the part. Thus, there may be catarrh of the nose, the throat, the air-passages, the bowels, the vagina, the bladder, or the urethra; but in popular language "catarrh" designates either a "cold" in general, a "cold in the head," or a chronic catarrh of the posterior nares (nostrils) and throat. Catarrhs in general arise from exposure to cold and wet and to sudden atmospheric changes. They are most common in persons who are ill-fed, and who are not accustomed to out-of-door exercise. The variety of catarrh known as a "cold" is by no means always easy of cure. The popular belief that "a cold must have its run" has some foundation. Hot foot-baths, laxatives, sedatives, demulcents, mild stimulants, or diaphoretics may, however, prove useful in many cases. Judicious exercise, bathing, and life in the open air tend to overcome the morbid inclination to take cold from which some patients suffer. Chronic catarrh of the posterior nostrils is an obstinate disease, best treated by systematic exercise and attention to other hygienic conditions, and by the use of salt water as a nasal douche. (See NOSTRILS, DISEASES OF.)

Chan'cre. See SYPHILIS.

Chick'en-Pox, a contagious febrile disease, chiefly of children, and bearing some resemblance to a very mild form of small-pox. Chicken-pox is distinguished by an eruption of vesicles or blebs, which rarely become pustular or yellow, and leave only a very slight incrustation, which falls off in a few days, without any permanent mark or pit as in smallpox. It is a disease of little or no danger, the fever being often hardly perceptible, and never lasting long. It usually occurs but once in any one patient.

Chil'blain [Lat. *pernio*], one of the secondary effects of cold and moisture upon the human system, principally affecting the feet, hands, nose, ears, etc. Chilblains are frequently chronic in their character. Mild cases are marked by swelling and redness of the affected part, accompanied by intolerable itching. The more severe forms assume an ulcerated, and sometimes even a gangrenous, character. Those troubled with chilblains should carefully protect the feet and hands from cold, should wash the feet frequently and dry them very thoroughly, and avoid going near a fire when they are very cold. Benzoated oxide-of-zinc ointment, citrine ointment, borax and sugar of lead in oil or glycerine, tincture of iodine, sulphurous acid solution, and various stimulant applications are all useful. The severer forms may need surgical treatment.

Chloro'sis [from the Gr. *χλωρός*, "pale green"], a disease almost peculiar to young women and girls, and usually associated with other troubles peculiar to that time of life. It takes its name from a greenish-yellow tint of the skin which some patients exhibit. There is also great pallor and debility, often disturbance of the heart's action, breathlessness, and a variously perverted and capricious appetite. The disease is characterized by a deficiency of the elements of the blood. Most cases are readily curable by exercise, good air, proper food and clothing, and, above all, by iron, which is almost a specific in this disease.

Cho'king, the obstruction of the pharynx or œsophagus, or more rarely of the larynx or trachea, by masses of food or other foreign bodies. Choking by obstruction of the pharynx or œsophagus is sometimes relieved by the operation of an emetic, sometimes by the use of gullet-forceps, of which there are many varieties, or by other appropriate instruments. Œsophagotomy, or cutting, has been resorted to, but this is one of the most formidable operations of surgery, and is not often necessary. When foreign bodies lodge in the larynx, aphonia, or loss of speech, is one of the symptoms. If the substance is in the windpipe or

bronchi, the surgeon may often detect its presence by auscultation. The symptoms caused by foreign bodies in the œsophagus are often surprisingly like those which occur when similar bodies lodge in the air-passages. These symptoms are various; there may be spasmodic coughing, redness of the face, ineffectual attempts to swallow, and great discharge of saliva, and generally there is great difficulty of breathing. Surgical aid should always be called.

Chol'era [Gr., probably from *χολή*, "bile"], a disease characterized by purging and vomiting, followed by great prostration, and in many cases by fatal collapse. Comparatively mild cases occur with frequency even in temperate latitudes, and are known as sporadic cholera or cholera morbus; and such cases, though very distressing, are seldom fatal, while the more severe or epidemic form (known as Asiatic cholera) appears to arise in India, where it is endemic, and to be carried by ships, caravans, religious pilgrimages, etc. westward to Egypt, Persia, and Arabia, and thence to Europe and around the world by the regular channels of commerce. The disease is probably of miasmatic origin, and local conditions may favor or check its local development; but whether the disease ought to be called contagious or not is one of the most warmly disputed points in medicine. It is certain that habitual personal contact with the sick is often not followed by the disease. It is held by many that the disease is propagated by drinking-water; by others, that its germs are taken up from the air the patient breathes. It is regarded by many as certain that the disease is largely propagated from the stools or alvine discharges of the sick; and all such discharges should be treated with powerful disinfectants, and deposited, if possible, in places not frequented by those who are well; and especial care should be taken not to let them be thrown into vaults and privies in common use.

Without describing the various stages of the fatal disease—the premonitory painless diarrhœa, the alarming and profuse purgation which follows, carrying off the fluids of the body, the profound collapse, the reaction, with the dangerous febrile condition which may follow—it is enough to say that treatment should be chiefly preventive. No diarrhœa in a cholera season should be neglected. Opiates will usually control the precursory diarrhœa. During the active stage of the disease cold compresses to the bowels are sometimes useful. The administration of diffusive stimulants in small doses during the stage of collapse should be persisted in. Friction by the hand may relieve

the spasm of the muscles. Great care should be taken for a long time lest a relapse should occur. The food of convalescents should be of the very lightest and blandest character for some days.

Chol'era Infan'tum, or Acute Intes'tinal Catarrh'. This intense and dangerous form of infant diarrhoea is mostly found in hot climates, the hot season, and close air; more amongst the poor than the rich. The usual cause is improper feeding in hot weather. The former is a direct injury; the latter, by debilitating the nervous system and lowering the functions of all the digestive organs, diminishes the general strength and power of endurance. Nursing infants are but seldom affected; many infants will recover from an attack by being returned to the mother's or nurse's breast. Still, an improper condition of breast-milk (an undue proportion of water, or fat, or caseine, or the admixture of medicinal agents taken by the mother or nurse, or a change produced by mental emotions in the latter) is known to be injurious. Weaned infants, however, and such as are brought up on artificial food, are mostly attacked. Artificial food is seldom identical, in its nutritive value, with mother's milk. Cow's milk contains less sugar and more butter and caseine than mother's milk, and requires cooking and skimming before being diluted with water (better still, barley-water). Vegetable food is dangerous unless carefully selected and prepared. Thus it is that the first passages in cholera infantum contain undigested food of all sorts, particularly lumps of coagulated milk, which is also brought up by vomiting. Afterwards the passages are very thin, watery, of an acid or fetid smell, very copious and frequent; vomiting accompanies this diarrhoea, more or less. Moaning and crying are soon replaced by debility, and even complete collapse; the body is rapidly deprived of a large portion of the water contained in it, and emaciates; the eyes lie deep in the orbits; the sutures and fontanelles of the skull sink; the skin becomes dry, the feet and hands cold, while the temperature of the trunk is rising; the face looks shrunk and senile; the pulse becomes weak and frequent, the voice feeble, the expression of eyes and face listless, and stupor or coma or convulsions set in. Death is a frequent result. The principal preventive consists in supplying the well infant with proper artificial food when no breast-milk is available, and at regular times, and in attending to its general health. When the disease has made its appearance the principal means of checking it are the following: during the first few (3-6-8) hours no food or drink ought to be given. The irritated stomach must be kept at rest;

vomiting will cease on that condition only. After that time give a teaspoonful of ice-water or a small piece of ice (size of a bean), with or without a few drops of brandy, every five or ten minutes, as long as the tendency to vomit persists. When feeding is to be recommended, avoid milk (except breast-milk) in whatever form. Barley-water, oatmeal gruel (strained), in tea or tablespoonful doses, now and then, with the white of eggs (1-3 in twenty-four hours), will readily be taken and well digested. Many cases will get well with this dietetical treatment. At the same time the air must be kept as cool and fresh as possible, day and night. The infant will recover faster out of than in doors. The medicinal treatment, which is, under all circumstances, the domain of a physician, varies according to the nature of the case. Mercurial remedies (calomel) can be avoided. Subnitrate of bismuth, with opium in small doses, and preparations of chalk, nitrate of silver, astringents, such as tannic or gallic acids, catechu, are frequently resorted to, the latter principally in cases which threaten to become chronic.

Cholera Morbus, acute gastro-intestinal catarrh in the adult. It is chiefly caused by errors of diet during the summer season, the stomach and intestines being irritated by indigestible food, acrid juices of fruits, or cold liquids at a time when the body is overheated. Vomiting, purging, paroxysms of painful colic, physical prostration, are the chief symptoms. Relief is obtained by anodynes, stimulants, warm enemata, and external use of mustard draughts and hot water.

Chore'a [Gr. *χορεία*, a "dance"], or **St. Vitus's Dance**, a disease characterized by irregular, involuntary, and often grotesque muscular action, without appreciable organic change in any tissue, and generally without pain or any known derangement of mental action or of sensation. It is most common in children after the second dentition and before puberty; much more common in girls than in boys; sometimes attacks pregnant women and other adults, though some cases once called adult chorea would now be recognized as locomotor ataxy, a very different disease. Chorea is sometimes hereditary, sometimes epidemic. Many writers have classed the dancing mania (the original "St. Vitus's dance"), tarantism, and the strange excesses of certain religionists (dervishes, French prophets, "jumpers," and "convulsionists") all as varieties of chorea. Stammering has been called a chorea of the vocal organs. The disease is sometimes associated with rheumatism and with anæmia. Such complications should receive special treatment. The metallic tonics are generally

useful, and so are systematic gymnastics, life in the open air, and a kind and unobtrusive discipline, which shall teach the young patient the power of the will over the movements of the body.

Club-Foot (*Talipes*). This deformity is mostly congenital, and usually affects both sides. The inner margin of the foot is elevated, the external one depressed and touches the ground. The deformity becomes more pronounced when the child begins to walk, sometimes to such an extent that the upper part of the foot takes the place of the sole. The leg becomes emaciated. A rational explanation is yielded by the consideration of the early condition of the fœtus. The lower extremities are first formed (about the end of the first month of pregnancy) on the anterior aspect of the abdomen of the fœtus, under the skin, in such a manner that the knee-pit is looking towards the abdomen. In order to assume its normal shape the whole extremity, including the foot, has to turn round its axis. When this process, as far as the foot is concerned, remains incomplete, club-foot is the result. Club-foot, when acquired after birth, results from paralysis of the extensors of the foot. In that case the action of the flexors results in the same deformity. Mild cases require but little treatment. Manual stretching of the foot, proper bandaging, the application of a splint or plaster of Paris, are often sufficient. More serious cases require the cutting of one or more of the flexors (tendo achillis, plantar aponeurosis, anterior tibial muscles), with bandaging or the wearing of an appropriate apparatus (Scarpa's shoe).

Colic [Lat. *colica*; Fr. *colique*; from the Gr. *κολικός*, "pertaining to the colon"], a term applied to diseases attended with severe pain of the abdomen; its supposed particular connection with the large intestine is not always certain. The disease is caused, at least in part, by irregular contractions of the muscular coat of the intestines. This complaint arises from various causes and exhibits different symptoms. It is sometimes attended with constipation, and ceases when the regular action of the bowels is restored. A good remedy in such cases is a dose of castor oil (about one ounce for an adult), with twenty or twenty-five drops of laudanum. Warm baths and fomentations are often necessary. When colic resists mild and simple remedies, medical assistance should be procured, for colic is closely allied, as a symptom, to several severe and dangerous diseases. Painter's colic arises from the absorption of lead into the system, and therefore attacks persons employed in lead-mines or using preparations in which lead is used. This latter disease is often called *colica Pic-*

tonum, or "colic of the Pictones," the latter being the ancient name of the inhabitants of Poitou, where this disease was once common. (See ENTERALGIA; also *Biliary Colic* and *Renal* (kidney) *Colic* under article CALCULUS.)

Co'ma [Gr. *κῶμα*, "heavy sleep"], a medical term signifying a state of lethargy or unnatural profound sleep. It occurs in apoplexy, epilepsy, and other diseases of the brain. The patient is quite or nearly insensible to external impressions. Coma is also seen in narcotic poisoning. In the fatal forms the breathing is stertorous, the pupils of the eyes dilated, insensible to light, and immovable.

Concus'sion [from the Lat. *concussio*, *con-*
cussum, to "shake violently" (from *con*, intensive, and *quatio*, *quassum*, to "shake")], in surgery, the disturbance caused by a fall or blow. In all severe injuries a concussion or shock is caused to the nervous system, which may require the assiduous care of a physician. (See SHOCK.)

Concussion of the Brain [Lat. *commotio cerebri*] sometimes causes alarming symptoms, even to suppression of the functions of the brain, yet without any apparent organic disease. Slight concussion of the brain (popularly called "stunning") causes vertigo, loss of memory, tinnitus aurium, and stupefaction; but these are temporary. When more severe, there is loss of sensation and volition, with vomiting, the patient being apparently in a sound sleep, but without stertorous breathing. The pulse is variable, being more rapid and feeble than in compression of the brain; the extremities are cold. Little can be done until reaction occurs, when the case can be treated according to general principles. In some cases of concussion it is necessary to use local or general stimulants, but usually moderate heat applied to the surface, abundant supplies of air, and proper adjustment of the injured parts are all that are required until consciousness is partly restored, when a small portion of wine or other stimulant may be useful. The effect of these should be carefully noted, and the patient should be placed in a comfortable position in bed during the process. In all cases absolute rest is essential. If the concussion has been severe, the patient is often not secure until a long time after, even though apparently well, for serious nervous lesions may be slowly developed.

Congen'ital Diseases. These must be distinguished from hereditary diseases, which may show themselves either soon after birth or at some later period, and from malformations of the infant, resulting from either an arrest of development or a disease of the

fœtus contracted during its intra-uterine life. Congenital diseases proper are—1st, transmitted from the diseased mother either before or during birth; 2d, acquired during birth, without a direct maternal influence; 3d, acquired shortly before birth. To the first class belong puerperal fever and primary syphilitic and gonorrhœal infection; to the second, asphyxia, atelectasis (unexpanded condition) of the lungs, and cephal-hæmatoma (sanguineous tumor upon the head); to the third, acute fatty degeneration of the fetus and newly born. *Puerperal fever* is transmitted from the mother; the blood of the babe is infected. The principal symptoms are high fever, abscesses in the subcutaneous tissue, particularly around the joints, erysipelas, and a severe form of jaundice. It terminates fatally within a limited number of days, rarely weeks. When the vagina of the mother is infected with syphilitic ulceration, the child is subject to be attacked with a *primary ulceration*. When it is the seat of gonorrhœal discharge, it gives rise to the most dangerous forms of *purulent inflammation of the eyelids*, which, unless treated at once, is apt to result in blindness. The treatment consists in absolute cleanliness; the eyes must be opened frequently and washed out with water. Ice is applied constantly to the outside, and a solution of nitrate of silver to the inside of the eyelids. *Asphyxia* is mostly seen after protracted labor or abnormal presentation of the child, the breech or the feet being born before the head. The child is born almost or apparently lifeless, blue or pale, with no respiration and no pulsation of the heart. Artificial respiration is brought on by slapping the buttock of the babe, by alternately placing it in warm and cold water, by slapping its breast with a wet cloth, by swinging it forcibly in the air, by the application of an electro-magnetic current to its chest. When the surface is very blue a few drachms of blood may be allowed to flow from the untied umbilical cord. *Atelectasis* depends on an absence of the normal expansion of the lungs which follows the entrance of the air. The muscles of the chest may not be sufficiently developed, or their innervation may not be satisfactory from some disease of the brain, or the lungs may be inflamed or filled with mucus or some foreign substance introduced into them during birth (blood, mucus, amniotic liquor, etc.). Emetics will empty the lungs (tickling of the fauces is sometimes sufficient), mustard plasters and the electrical current excite the nerves, and the above-mentioned methods of inducing respiration will restore the normal action.

Conges'tion [Lat. *congestio*, from *con*,

"together," *gero, gestum*, to "carry" or "heap"], fullness of blood, or hyperæmia. Congestions are either active or passive. Active congestions are always essential parts of a further morbid process, such as inflammation. Passive congestions are often determined by some mechanical cause of obstructed or retarded circulation. Active congestions of the brain or lungs are in themselves very alarming symptoms of disease; while the passive congestions, resulting from cirrhosis of the liver or from organic disease of the heart, are fruitful causes of local or general dropsies.

Conges'tive Fever. See INTERMITTENT FEVER AND REMITTENT FEVER.

Constipa'tion [from the Lat. *con*, intensive, and *stipo*, to "stow," to "crowd," referring to that state of the rectum in which it is impacted with fecal matter], a condition of the system marked by sluggish action of the bowels upon their contents, due either to diminished secretion of the juices of the mucous membrane or to a want of action of the muscular coat of the intestines. Sedentary habits predispose to constipation, and so does too large a proportion of animal food. Brown bread, ripe fruits, fresh vegetables, and active exercise tend to avert this disorder. An abdominal compress of cold water, covered with a flannel bandage, sometimes proves beneficial. For many cases the use of mild cathartics is necessary. They may be taken in proper doses for many years without bad effects. The use of nuxvomica in small daily doses is often useful, and the same is true of belladonna in some constitutions. It is frequently advisable to employ enemata of warm or cold water, and also kneading or careful manipulation of the abdomen. But perhaps the most rational treatment is a careful readjustment of the diet and the adoption of active habits of life. Ill-chosen and ill-cooked food, perhaps the most frequent cause of intestinal troubles, should be especially avoided. There is no doubt also that habitual constipation may in some instances be overcome by the persistent and systematic attempt to perform the impaired function at a regular time each day.

Consump'tion [Lat. *consumo, consumptum*, to "wear away"], the popular name of various diseases characterized by a wasting of the body, such, for example, as "anæmia" (known as "consumption of the blood"), but applied especially to *phthisis pulmonalis*, a very common and very fatal disease of the lungs. It has long been taught, upon the authority of Laennec, Louis, and Andral, that the characteristic symptoms of pulmonary consumption depend upon the presence in the lung-tissue of a new growth, or neo-

plasm, called TUBERCLE (which see); but the studies of Virchow, Niemeyer, and other recent pathologists have demonstrated that cases of originally tuberculous consumption are quite rare, although they do occur, the presence of the tubercles giving rise to local pneumonic inflammation in their neighborhood; while ordinary consumption is generally characterized by (1) local consolidation, (2) cheesy degeneration of the solidified spot, and (3) destruction of the degenerated tissue and formation of a cavity. This is the direct result, in most cases, of a "catarrhal" inflammation—that is, of an inflammation of an epithelial surface, such as lines the air-passages—the inflammation being associated with a free discharge of mucus from the surface of the membrane. Next, the air-vesicles of the lungs become filled by inhalation and by other means with the young cells of the secretion. If, as in non-fatal cases of ordinary pneumonia, these cells soon undergo liquefaction and absorption, the patient recovers. But if the accumulation of cells remains unabsorbed in the air-vesicles, it suffers a cheesy degeneration, a sort of slow decay. It appears that an inflammatory process is set up around this caseous degenerate mass, and that the cheesy degeneration is soon present in the inflamed lung-tissue itself. After a time the degenerate mass may assume a more or less complete purulent form, and may be discharged by coughing. This, however, does not always happen. The mass may be absorbed, the pulmonary tissue become indurated and callous, without a trace of tubercle; the bronchial tubes may become dilated, and the disease, spreading slowly, may disorganize but not consume the lungs. This is a very common condition in old consumptive cases. Meanwhile, the less changed bronchi near the seat of the disease pour forth a profuse catarrhal secretion, causing copious expectoration. The pleura near the seat of the disease becomes thickened, and adheres by organized exudations to the wall of the chest. In the majority of cases these changes begin at the apex of one or both lungs.

The first subjective symptoms are usually dull pains about the collar-bones, tightness across the chest, and there is frequently a dry, hacking cough in the morning and late at night. Headache, weariness, dyspepsia, and loss of appetite are often present. The pulse increases permanently, in most cases exceeding 90 or 100 beats in a minute. The rapidity of breathing is usually increased. An early symptom is a high evening temperature—103° or 104° F. In the second stage night-sweats are often extremely severe, pus

is freely expectorated, hectic fever is decidedly present, the pulse is more frequent. In the third stage, when considerable cavities often form in the lung, the preceding symptoms are much intensified; colliquative diarrhœa supervenes, and yet in many cases the patient continues serene and hopeful, and the mind is remarkably clear and active.

The causes of consumption are very numerous. Niemeyer assigns the first place as a cause to that depraved, ill-nourished state (called the serofulous diathesis) in which there is a tendency to the increased production of young cells. Any depressing circumstance may tend to the establishment of consumption. An hereditary tendency is one of the most important of these circumstances, but any depressed state of the parent, especially of the mother, whether consumption, starvation, anæmia, serofula, or any other dyscrasia, appears to have a nearly equal effect on the offspring. Bowditch and others have shown that, other things being equal, it is most frequently observed in places where the air and soil are charged with moisture. Cold weather in itself appears to have little or no tendency to produce the disease, but a very changeable temperature is one of its most fruitful causes.

There has been considerable discussion as to whether consumption is or is not a contagious disease; and facts are not wanting which appear to show a danger of infection, especially to those who take care of and intimately associate with consumptives. Another interesting question is whether consumption is ever caused or promoted by habitual drunkenness, either in the case of the drunkard or of his offspring. The best opinion among physicians appears to be that while in selected cases alcoholic stimulants may be useful adjuvants, the remedy is a dangerous one, since there is no doubt that many more consumptives are injured than are benefited by it. On the offspring of the consumptive the effect of hard drinking is confessedly deplorable. Over-study at school appears to develop the disease in some young people. Overwork, factory-life, the grinding of metals, cabinetmaking, and all kinds of dusty or sedentary work are undoubtedly prolific sources of the disease. Mental trouble, excessive care, too frequent child-bearing, and sexual excess are to be reckoned in the list of causes. Consumption frequently follows measles, typhoid fever, and whooping cough, not improbably resulting from the bronchitis which accompanies those diseases.

It is also thought that pregnancy will check the disease in the female; and while there are numerous observations which go to show that for the time the disease is some-

times (but not always) held in abeyance, it is certain that this abeyance is often followed by a period of greatly increased activity; and the probability that a child born in such circumstances will be sickly and short-lived ought to prevent the resort to any such practice as a curative measure.

The physical signs of consumption are those which are determined by inspection, palpation, auscultation, and percussion of the chest. Their relative importance can be appreciated by none except the well-trained and experienced diagnostician.

The treatment of consumption cannot be discussed except in the most general terms, for no disease is less amenable to mere routine treatment. Yet there is no reasonable question that, especially in its earlier stages, this disease is a curable one. One of the first requisites is the establishment, if possible, of normal nutrition—a process which is usually much impaired in those liable to this disease. The use of such tonics as quinia and strychnia in some conditions, the administration of cod-liver oil, either as food or for its assumed alterative powers, and judicious change of climate, are among the most useful measures. Alcoholic stimulants benefit some patients and injure others, and on the whole do more harm than good; the hypophosphites of soda and lime appear to cause increase of weight and diminution of cough and expectoration in many cases; thorough counter-irritation of the chest-walls is a very important adjuvant; the wearing of sufficient clothing to protect the body from sudden changes of temperature is not less important. Systematic, and even severe, physical labor benefits some patients, but others appear to be injured by any but the gentlest exercise. Special symptoms, like diarrhoea and night-sweats, will require palliative treatment. Life in the open air is advisable, except in wet and bleak weather. The dry air of the Western plains and of the Rocky Mountain region, the equable weather of Florida, and the dry, sandy soil and balsamic exhalations of the great pine forests of the South, are believed to afford favorable conditions for recovery in many cases. Much depends on the peculiar history and temperament of individual cases, and the proper appreciation of these conditions is likely to tax the judgment of the ablest practitioner.

Contu'sion. See WOUNDS.

Convul'sions [from the Lat. *convello*, *convulsus*, to "pull violently"], an acute nervous affection occurring in paroxysms, during which the patient loses consciousness, the muscles of the body are spasmodically contracted, and the limbs first stiffened and twisted, then agitated by irregular involuntary movements. The face is distorted, the

eyeballs rolled upward, the teeth clenched, biting the tongue, which protrudes at the beginning of the attack. Respiration is arrested by the stiffening of the chest-muscles and by closure of the glottis; the patient grows black in the face, and froth oozes from the mouth, and sometimes from the nostrils; the veins of the neck swell. After some time the muscles relax again, respiration is restored, the agitation of the limbs ceases, the patient either returns entirely to consciousness or falls into a heavy sleep, which may last several hours. The appearance and the nature of the attack are the same in the convulsions of epilepsy and in the so-called eclamptic convulsions of children or of women in childbirth. They may result from any cause that first irritates and then suddenly abolishes the functions of the brain and spinal cord. Convulsions occur, therefore, in diseases of the nervous centres; in diseases of other organs of the body, that transmit irritation to these centres; finally, in morbid conditions of the blood which interfere with their nutrition. Under the first head may be mentioned congestion or anæmia (bloodlessness) of the brain, inflammations, tumors, finally premature ossification of the bones of the head, by which the brain becomes subject to abnormal pressure. In other cases more obscure there seems to exist in the brain and cord a congenital susceptibility to irritation, and consequent exhaustion of functions, so that the most trifling circumstance may occasion a convulsion. It is then that are observed the convulsions of hysteria and of epilepsy. The latter is only distinguished by the constitutional tendency that persists during the intervals of the attacks, and suffices to cause their removal. The hysterical convulsion, however, offers some peculiarities, and consciousness, though perverted, is not abolished, the interference with respiration is less complete than in typical eclampsia, and leads to involuntary laughing and crying; there is no lividity of the face or frothing at the mouth; the return to consciousness is immediate, without the transition stage of heavy sleep. Neither the irregular convulsive movements of chorea ("St. Vitus's dance," "clonic" muscular contractions) nor the rigidity of tetanus ("tonic" muscular contractions) are sufficient to constitute a convulsion in which the two forms of muscular contraction are combined, the last occurring at the beginning, the first at the end of the attack.

Convulsions dependent on transmitted irritations occur principally in children. They may occur spontaneously, owing to a congenital predisposition by which normal physiological processes become irritating, or they

may be excited by inflammation of the gums in dentition, by indigestion, by worms, by the invasion of acute diseases, as pneumonia or eruptive fevers; by some accidents, as extensive burns. Women in childbirth are liable to convulsions of a similar character, which may be excited by the mere act of parturition. This dangerous complication (puerperal eclampsia) is more frequently, however, associated with an alteration of the blood that is liable to occur during pregnancy, and due to transient kidney disease (nephritis). The kidneys act imperfectly, and hence part of the elements of the urine that should be secreted by them are retained in the blood, poisoning it, while at the same time part of the albumen of the blood passes off in the urine. These convulsions are therefore called albuminuric or uræmic, and afford most striking illustrations of the morbid influence of altered blood upon the nerve-centres. They occur also in genuine nephritis or Bright's disease, and in that which often complicates the second and third stages of scarlet fever. Various mineral or narcotic poisons introduced into the blood have a similar effect to uræmia in causing convulsions.

Any convulsion may prove fatal if the arrest of respiration be sufficiently prolonged. The danger varies very much according to the cause, the uræmic convulsions of women in childbirth (*puerperal eclampsia*) being far the most frequently fatal. After them may be successively ranked—uræmic convulsions in primary nephritis, or that complicating scarlet fever, and those caused by narcotics (opium) or mineral poisons (lead).

The treatment of convulsions may sometimes be addressed exclusively to the cause, as in the last three cases just mentioned, where the danger of the paroxysm itself is known to be small. In the other cases, where life is liable to be endangered by the duration or rapid repetition of convulsive attacks, these urgently demand relief. Means of relief are—1st, compression of the carotids; 2d, alcoholic stimulants; 3d, venesection; 4th, chloral; 5th, chloroform; 6th, anti-hysterical medicines; 7th, warm baths; 8th, cold applications to head. Each is adapted to a special case. Compression of the carotids has been used principally in idiopathic epilepsy (where, as said, the paroxysm itself is often left without treatment). It is intended to relieve the congestion existing at the base of the brain, and has sometimes proved successful. Cold applications are used for the same purpose, and may be combined with the other methods of treatment. Stimulants are only used where the convulsion results from hæmor-

rhage or inanition. Venesection may be required in cases of intense venous congestion of the brain, as indicated by extreme lividity of the face and distension of the veins of the neck. It is most often needed in puerperal convulsions. Large doses of chloral are especially useful for infantile convulsions, or for those of scarlet fever, or during the interval of attacks to prevent their renewal. *Veratrum viride* is a powerful agent to lower the pulse and increase the force of the heart's impulse; hence it may be used in the same cases as venesection, to dissipate the stagnation of blood in the veins. The warm bath may be used in nearly all cases, except perhaps in puerperal convulsions, where it may be contra-indicated by the difficulty and danger of moving the patient.

An hysterical convulsion may be treated with the nervous stimulants formerly called antispasmodics, especially assafœtida, valerian, ether (internally).

Corn (*clavus*), [from *cornu*, a "horn"], a horny accumulation of epidermic cells upon the surface of the human foot, produced by the pressure of the boot or shoe. Corns may be softened by hot water or poultices, and the horny part can be carefully removed with the knife. When painful, they may be generally much relieved by the occasional application of a solution of nitrate of silver. Various surgical appliances have been devised for the relief of corns, which when neglected may give rise to serious trouble.

Cor'pulence. See OBESITY.

Cos'tiveness. See CONSTIPATION.

Cough [Lat. *tussis*], a physiological act or operation, which consists in the sudden expulsion of air from the lungs, at the beginning of which act the glottis is closed. Coughing is designed for the expulsion of foreign or secreted matters from the air-passages. It is largely a reflex action, generally arising from local irritation. When the irritation is the result of disease, coughing may be a very important symptom. It is partly voluntary and partly involuntary. A cough may sometimes be relieved by expectorant remedies, by mucilaginous diluent draughts, by warm foot-baths, by stimulants, and very often by small doses of opium or of other sedatives.

Coxal'gia, or Cox'i'tis (*morbus coxarius*, "hip-joint disease"), a chronic inflammation of the hip-joint, which may begin either in the head of the thigh-bone or the socket of the hip-bone, or else in the membrane (*synovial*) that lines its cavity, but which finally extends to all its tissues, cartilages, ligaments, and surrounding soft parts. Inflammation of the bones (*osteitis*), by far the

most common origin of the disease in children, is chronic and insidious in its development, and is favored by the incomplete ossification and active nutrition of the bones in childhood. Inflammation of the lining membrane (*synovitis*) is the most frequent form of hip disease in adolescence, and then is often of rheumatic origin. Chronic infantile coxitis principally affects children between one and five years of age, and is often awakened by a fall or blow, especially when such accident occurs to children of a lymphatic or scrofulous constitution. The very first symptom is lameness, followed by pain, first felt in the knee, afterwards excited in the joint itself by direct pressure, by motion of the limb, or by the weight of the body resting upon it. To lessen this weight the patient rests on the ball of his toes, and drags the leg in walking, stiffly extending it. At this stage it is turned a little outward by spasmodic contraction of the muscles on the outer side of the joint. But very soon, in order to still further lessen the weight, the body bends over on the thigh, and the arm and lame part of the back, with the abdomen, are carried forward. When the patient lies down, therefore, a space is left between the body and the bed, and if the spinal column be forcibly straightened out and the curve flattened, the thigh in turn is bent on the body by dragging of the muscle that runs from the spinal column to the head of the thigh-bone (*psosas*). Still, for the purpose of lessening weight, the hips are tilted towards the painful side, and appear oblique, while the leg is thus apparently lengthened. Behind, the nates are flattened. It soon becomes impossible to glide the head of the thigh-bone in its socket; the whole hip moves with every motion communicated to the leg. This sign is most characteristic of the confirmed disease; it is due first to the spasmodic rigidity of muscles—later to inflammatory adhesions.

In the second stage liquid is poured out into the cavity of the joint to increase the space of this cavity, the thigh is more strongly bent on the body (flexed), and drawn inward (adducted), so that the foot crosses the opposite leg. The affected limb is therefore apparently shortened. A swelling appears in the groin and at the outer aspect of the thigh; the pain becomes intolerably severe; standing and walking are impossible.

In the third stage the cavity fills with matter, the ligaments of the joint are relaxed, abscesses form in the neighborhood, and all the soft parts are swollen by inflammatory exudations. Dislocation occasionally though rarely occurs. More often the

head of the thigh-bone separates from its shaft and adheres to the socket of the joint, while the socket itself is enlarged. The patient's strength is severely undermined, hectic fever sets in, the emaciation is extreme, and death may occur gradually from exhaustion, or more rapidly from acute absorption of pus.

The diagnosis of *morbus coxarius* is only difficult in the first stage. The lameness may simulate that of muscular paralysis, from which it is distinguished by the freedom with which the head of the thigh-bone may be moved; or the pain in the knee may fix suspicion on the wrong joint; or the thigh may exactly imitate hysterical muscular contraction; but in this affection the limb relaxes completely under chloroform.

The prognosis for spontaneous cure is always very unfavorable. After suppuration death may be caused by pyæmia, by exhaustion, by general tuberculosis, or by amyloid disease. Appropriate treatment of the first and second stages offers about 50 per cent. of recoveries; operative treatment of the third stage has so far cured about one-third of the cases submitted to it. In a large number of cases, although the inflammation is arrested, and hence life is saved, the joint becomes permanently immobilized (ankylosis) by fibrous bands within and around its cavity, that hold the articular surfaces firmly together (false ankylosis). This result is to a certain extent favored by the treatment adopted for the cure of inflammation; it is important therefore that the stiffened limb be left in the most favorable position for use—namely, extension.

The treatment varies according to the stage of the disease. During the primary osteitis that so often precedes inflammation of the joint, and is indicated by the one symptom of lameness, constitutional treatment is to be adopted—cod-liver oil, iron, cinchona, nourishing food, fresh air, and salt-water bathing. As soon as the movements of the joint are compromised, local treatment becomes of primary importance. It aims—1st, to immobilize the joint, so as to prevent friction of the inflamed parts; 2d, to extend the limb, so as to separate as much as possible the folds of the lining membrane, to reduce to a minimum size the cavity of the joint, and thus favor the re-absorption of fluids; finally, to leave the limb in the best position for use should it become permanently stiffened. The limb can only be maintained in extension by a force sufficient to overcome the spasmodic muscular contractions. Many apparatuses are devised for this purpose, in which the limb is straightened out and fastened to an

inflexible plane, and forcibly retained in this position by means either of a weight attached to the foot or a sliding screw at the knee. The simplest form of apparatus is made by swathing the limb in bandages stiffened by plaster of Paris or dextrine. These are only adapted to the earliest stage, or when cure is already progressing. It enables the patient to walk about. This facility is also afforded by steel apparatus that supports the limb at the waist and foot, and gradually extends it by continued traction at the knee. In other cases the patient is kept in bed, the leg fastened to a simple long splint, with a cross-piece under the foot, to which is attached the weight. A large double gutter, in which were laid the entire pelvis and both lower extremities of the patient, was formerly famous, but is now seldom used. During the employment of such apparatus ice may be applied to the joint to subdue acute inflammation, occasionally blisters, where fluid has been rapidly effused, more often pressure by means of elastic bands, a powerful means of promoting reabsorption.

When suppuration has occurred within the joint, and especially when pus has discharged externally by one or more fistulae, it is necessary to amputate (resect) the head of the thigh-bone. Very extensive destruction of the hip-bone and certain general diseases, amyloid disease or general tuberculosis, with uncontrollable diarrhoea, contra-indicate the operation. After it, death may result from such complications or from surgical fever (pyæmia, septicæmia). When successful, however, the patient is rescued from an otherwise certain death, and the joint recovers its integrity, ankylosis being much less frequent than after treatment by immobilizing apparatus.

Creeping Pal'sy. See CRUVEILHIER'S DISEASE and PROGRESSIVE MUSCULAR ATROPHY.

Croup. All the forms of croup have one thing in common—viz. an obstruction (catarrhal or inflammatory) in the interior of the larynx, particularly on the vocal chords. The milder form is called "false croup" or "pseudo croup." The larynx is reddened, its mucous membrane swelled, and its secretion of mucus usually increased. Thereby the passage of air through the larynx is impeded, and spasmodic action of its muscular apparatus effected. It is frequently found in children who have before suffered from "colds," especially from catarrh of the throat and enlarged tonsils, and who have been too carefully kept from the contact with cold air and cold water. The attack of "pseudo croup" is sudden or preceded by nasal or bronchial catarrh. It takes place

after the child has been asleep for some hours. It wakes up about midnight with a barking cough, loud and laborious respiration, small and frequent pulse, and more or less fever. In bad cases the veins of the neck and face swell, the face is bloated and bluish, and suffocation appears imminent. This attack may last from half an hour to six hours. It terminates in perspiration, the cough becoming moister, the voice being hoarse, but may return in the next night. Some children are apt to have many attacks in the course of many years. There are no membranes in the throat, no glands swollen round the neck. A very severe attack requires an emetic (powdered ipecac, sulphate of zinc, sulphate of copper, turpeth mineral); milder attacks require very little or no treatment. Let the child drink a little hot milk at short intervals. It must not sleep longer than an hour at a time, and should take a drink on waking up. Put a mustard plaster round the neck, or apply cold water at short intervals. Where the throat is sore, ice-pills every five or ten minutes; where inhalation is very spasmodic, half a teaspoonful of paregoric (one dose) or one grain of Dover's powder. Treat the consecutive general catarrh for four or five days with uniform warm (not hot) temperature of the room, warm water inhalations (kettle on the stove), small doses (hourly) of ipecac, or an antimonial preparation or muriate of ammonia. Where there is a chronic catarrh of the throat (dryness, redness, swelled tonsils, hacking cough, snoring), a teaspoonful of glycerine as a preventive at bed-time.

While this "pseudo croup," commonly called "croup," is a very mild disease—we have never seen a case terminating fatally—the other form, or "true croup," "membranous croup," is very dangerous. Under ordinary circumstances, and with a treatment exclusively medicinal, ninety out of a hundred die. It consists sometimes in simple inflammatory swelling ("laryngitis"), but usually in the obstruction of the larynx by a deposit of a whitish, grayish, or (through admixture with a little blood) darker "croupous" or "diphtheritic" membrane. The deposit may take place upon or into the normal tissue of the organ. It seldom originates in the larynx; sometimes ascends from the trachea; mostly descends from the throat, where it is discovered in one or more small spots or over a larger surface. In exceptional cases it extends over the interior surface of the nose, and the mouth. Such deposits may be known to exist for days; they will then descend, result in hoarseness, increasing to complete absence of voice (aphonia), and in great difficulty of respiration, with final suffocation. When the deposits

cover the whole interior of the larynx, both inspiration and expiration are impeded, and aphonia is complete. When they result in serous (watery) swelling of the larynx (especially the posterior insertion of the vocal chords) only, expiration is easier and the voice not entirely suppressed. The first stage is either that of throat diphtheria or of a simple catarrh only, which is attended with but little fever, and therefore little thought of. It may last a few days. In the second stage (twelve hours to fourteen days) the symptoms of obstruction show themselves; the voice is hoarse, and at last absent; respiration is slow, labored, and loud; the muscles of the neck and chest exerted to their utmost; the insertion of the diaphragm drawn in with every inspiration, deep grooves forming with every inspiration above and below the clavicle, the child tossing about, supporting itself on its knees, and throwing the head backward. The lips begin to exhibit a bluish hue. This symptom (cyanosis) increases in the third stage, where the influence of the insufficient oxygenization of the blood is more visible in general paleness, bluishness, in sleepiness, in the frequent and irregular pulse, in the cool surface, convulsive twitchings, and loss of consciousness. Unfortunately, the latter symptom is not constant, many children dying with undisturbed intellect. Death is the result of direct suffocation, or the result of a complication of the disease with bronchitis or pneumonia. Medicinal treatment is very unsatisfactory. We seldom succeed in dissolving and removing the membranes. Nitrate-of-silver applications to the larynx have justly been discarded. Inhalation of diluted lime-water through an atomizer or of lactic acid in glycerine and water (1: 8-10) has proved successful in a few instances. Emetics are of use in such cases *only* where the membranes are known to be partially loosened (peculiar flapping sound in respiration), or when the presence of mucus, in addition to a membrane, proves dangerous. Ice-pills frequently, ice applications to the throat, moist air, 1-2 grains of chlorate of potassa in a teaspoonful of water every $\frac{1}{4}$ -1 hour; inhalations of carbolic acid, either through an atomizer or sprinkled through the room; muriate of ammonia evaporated on a stove or hot coal,—all such means may be tried, but not to such an extent as to interfere with a copious supply of pure air, the effect of which may still be improved by inhalation of oxygen gas. Where the disease runs its course with fever, quinia, seldom aconite or veratrum. Most cases will resist treatment. Twenty or twenty-five per cent. will be saved by tracheotomy, an operation con-

sisting in the artificial opening of the wind-pipe below the obstructed larynx. This opening in the trachea is kept patent by means of a silver or hard-rubber tube inserted in it until the disease has disappeared from the larynx. The relief given by this operation is surprising, and although the mortality after its performance is still very great, death is almost always easier, resulting more from exhaustion than from suffocation.

Cruveilhier's Disease. See PROGRESSIVE MUSCULAR ATROPHY.

Cysti'tis [Gr. *κυστις*, the bladder], inflammation of the bladder. It may be acute or chronic. It is more frequent in men than in women. It may be the result of blows, kicks, bruises, punctured or incised wounds. It also occurs from holding the urine too long, from urine which is irritating—either highly acid or very alkaline—or from the irritation of calculus and gravel in the bladder. In men it frequently results from gonorrhœa of the urinary passage; in old men, from enlarged prostate (neck of the bladder), causing constant detention of alkaline urine; and in women, from inflammations and diseases of the uterus and pelvic cellular tissue. The symptoms are chilliness, fever, nausea and vomiting, prostration of strength, pain and sense of heat over the bladder, constant desire to urinate, often with inability to do so, and the voiding of urine thick and creamy like pea-soup, which under the microscope is found to be full of mucous and pus cells, epithelial scales from the bladder, and frequently blood. The treatment consists in applying in some cases ice-packs over the bladder, in others hot poultices and fomentations sprinkled with laudanum, opiates and chloral by the mouth to allay pain, the free use of alkaline and demulcent drinks, and the withdrawal of the urine by the catheter twice daily if practicable, and washing out the bladder with tepid or cool water, medicated or carbolated. In chronic cystitis in men the urine must be regularly drawn and the bladder washed out. If stricture exist, it must be dilated or incised. In women an artificial opening into the vagina is sometimes made to cure the bladder by constant free drainage.

Deaf'ness, loss or imperfection of hearing, may be congenital or acquired, permanent or temporary, complete or partial. It may be (1) "nervous;" (2) the result of local disease or accident. (See EAR, DISEASES OF.)

Deliri'um Tre'mens (*i. e.* "trembling delirium"), a morbid affection caused by the action of alcoholic drinks, and often afflicting hard drinkers after severe accidents or attacks of acute disease. Delirium, trembling and subsultus of the muscles and ten-

dons, wakefulness, and rapid pulse, are characteristic symptoms. The patient sometimes suffers extremely from the most frightful apprehensions, and frequently thinks he sees grotesque and horrible objects. The tongue has a thick furry coat, the skin is generally cool and covered with sweat, and the patient gives forth a characteristic saccharine odor. The blood and fluids of the brain are loaded with alcohol, and often (especially in old patients) there are abundant degenerative changes in the brain, lungs, liver, etc. Death occurs in about one-sixth of the cases. The mortality appears to have been formerly much greater than at present. The treatment is various. Sleep may be induced by the use of chloral or bromide of potassium, and in long-continued cases opiates may be cautiously administered with the happiest results. Patients nearly always call for alcohol in some form, but this desire should not, as a general rule, be gratified. The strength should be kept up by beef-tea, milk, raw eggs, etc. Cinchona bark or quinine should be given as a tonic, and chloral, bromides, and valerian to secure sleep and allay excitement.

Dengue,* den'ga, a disease known by the names of dunga, dandy, breakbone fever, etc., an epidemic, seldom fatal, which has prevailed at different times in the southern parts of the U. S. and in the East and West Indies. Its symptoms are headache, fever, pain and swelling of the smaller joints, an eruption of the skin, and gouty pains which often cause lameness for a considerable time. It appears to be of a rheumatic character.

Diab'etes [Gr. διαβήτης, from διά, "through," and βαίνο, to "go"], the name of two diseases characterized by the excessive excretion of urine; whence the name. *Diabetes insipidus* (now called POLYURIA, which see) is distinguished from the other much more dangerous disease by the fact that the urine consists chiefly of water. It is neither frequent nor formidable. But *Diabetes mellitus*, "sweet" or "honeyed diabetes" (*Mellituria*), is one of the most incurable and serious of diseases. The urine has its specific gravity greatly increased by the presence of diabetic sugar, a substance believed to be identical (in most cases) with liver-sugar, and very closely approaching grape-sugar in its composition and reactions. In some cases it appears to be muscle-sugar (*inosite*). The disease is further characterized by indigestion, intense thirst, wasting, prostration of mind and body, and in many cases by degenerative changes in the tissues. Its causes are obscure and its treatment not well understood.

* *Dengue* is the Spanish for "dandy" or "fop," and is applied to this disease on account of the remarkable stiffness of the patient's motions.

Some cases are greatly benefited by opium and the use of strictly nitrogenous food, like bran or gluten bread and skim-milk. Temporary diabetes has been observed after the administration of woorari poison and other drugs.

Diarrhœ'a [διάρροια, from διά, "through," and ῥέω, to "flow"], a disease characterized by frequent soft alvine discharges; acute or chronic intestinal catarrh. Many writers have drawn nice distinctions between the various assumed varieties of this disease, which indeed is very frequently a symptom rather than a distinct disease; but nearly every case is in reality due to inflammation or irritation of some part of the intestinal canal. Diarrhœa as a symptom of cholera, dysentery, typhoid fever, pulmonary consumption, and some forms of peritonitis, is treated of under these respective heads. When resulting from local or general disease of the alimentary canal, its symptoms and treatment vary greatly according to the age of the patient. In infants both its acute and chronic forms are very frequent and fatal. These cases often depend on improper food and clothing—less frequently upon disturbances caused by dentition than is generally supposed. These cases require, first, a careful attention to hygienic conditions. Flannels should be worn next to the skin. If a milk-diet should disagree, as it often does, finely-cut raw beef or strong broth may be given to the child. Medication should generally be cautious, but active. Many children suffer or die from over-medication, and still more, probably, from lack of active treatment. If scybalous masses of fecal matter exist in the bowels, they should be cleared out by cathartics, such as rhubarb, etc., with aromatics or castor oil. The proper use of astringents, tonics, and opiates in infantile diarrhœa is a matter requiring much discrimination. Chronic diarrhœa in the adult is an obstinate and rather common disease. A certain proportion of the cases are improved by iron, quinia, salicine, and other tonics. Change of climate, visits to mild saline chalybeate springs, sea-bathing, etc. are useful in many instances. Balsam of copaiba relieves some patients with surprising readiness. Astringent remedies, as kino, catechu, and opiates, have much value as palliative, and sometimes as curative, agents. The "diarrhœa and cholera mixtures" for adults contain usually astringents, opiates, chloroform, capsicum, and camphor. In the simple acute diarrhœa of temperate climates adults previously well are in general promptly cured by these agents, judiciously administered.

Diphthē'ria [from the Gr. διφθέρα, the

"skin" of an animal, in allusion to the false membrane described below], an acute disease, characterized by inflammation of the mucous membrane of the pharynx, attended by an exudation of lymph, often assuming the character of a false membrane, which may extend into the larynx and air-passages, into the œsophagus, and into the mouth, occasionally also appearing upon raw or mucous surfaces of other parts of the body; it is also attended by prostration and albuminuria, which may or may not be persistent. Diphtheria is not a new disease, but its nature having been investigated by Bretonneau (who gave it the name *diphtheritis*), it has of late received much attention, more especially from its present frequency and the terrible fatality which distinguishes it. Its duration and symptoms are variable, and the distinctive exudation is by no means of uniform appearance. In general, the mucous membrane is dark and congested, and the exudation growing from one or more centres if torn away leaves a bleeding and sensitive surface. The membrane itself frequently is the seat of a microscopic vegetable growth (*oidium*), believed by some to be an essential part of the disease itself. The prognosis is always grave, no case being free from danger. The mildest attack may be followed by paralysis or by fatal prostration. No routine treatment can be laid down for this disease. In mild cases it is permissible to use detergent chlorinated washes and local applications of carbolic acid, sulphate of zinc, and glycerine for the mouth, and the general treatment may be mainly expectant, provided the pulse is firm. When the constitution is depressed, sulphate of quinia has the happiest effects upon many cases. Tincture of iron, alcoholic stimulus, carbonate and muriate of ammonia, with nutritive liquid diet, are needed in severe cases. The inhalation of vaporized water is an excellent measure. The treatment of the various sequelæ of diphtheria requires the careful use of tonics, such as strychnia and iron, with the best hygienic conditions.

Dipsoma'nia [from the Gr. *δίψα*, "thirst," and *μανία*, "frenzy"] is a term sometimes applied to DELIRIUM TREMENS (which see), but of late more especially used to designate a morbid craving for alcoholic drinks, sometimes called methomania. Of late, this craving is looked upon as a disease, and it has been very successfully treated in "inebriate asylums" in various countries.

Disloca'tion [from the Lat. *dis*, "apart," and *loco*, *locatum*, to "place"], otherwise called **Luxa'tion** [from the Lat. *luxo*, *luxatum*, to "loosen"], in surgery, is the displacement of a bone from its proper relation to another bone with which it is articulated.

A "complicated" dislocation is the displacement of a bone, accompanied by a severe local lesion of the soft parts, or fracture of a bone. "Congenital" dislocations are those which occur before birth. The restitution of a dislocated bone is called its "reduction." Reduction of recent luxations is usually a comparatively easy task to those who have the requisite knowledge and experience, but in old and long-neglected cases it is frequently a most formidable operation, and is liable to be followed by bad consequences to the patient.

Drop'sy [a corruption of the old English *hydropsy*; Gr. *ὑδρωψ*, from *ὑδωρ*, "water;" Lat. *hydropisis*; Fr. *hydropisie*; Ger. *Wassersucht* (i. e. "water-sickness"), a disease characterized by excess of the natural secretion of fluid in any of the serous cavities of the body or in the areolar tissue. If the cerebro-spinal fluid be increased, it constitutes *hydrocephalus*, or "water on the brain." If the excessive secretion (exudation) takes place from the pleura, it is called *hydrothorax*, or "dropsy of the chest." If the fluid collect in the abdominal cavity, the disease is called *ascites* (from the Gr. *ἀσκίς*, a "skin," or leathern bag for water or wine, alluding to the form of the patient's body), a disease which may arise without assignable cause, but which most frequently comes from cirrhosis of the liver, a contracted, hardened condition of that organ, mechanically obstructing the portal circulation, and thus leading to transudation of serum from the blood-vessels. Habitual intemperance is its most frequent cause. General dropsy of the serous and areolar tissues is called *anasarca* (from the Gr. *ἀνά*, "throughout," and *σάρξ* (gen. *σαρκός*), the "flesh"). Obstructive organic disease of the heart and degenerative diseases of the kidneys are the most frequent causes of general dropsy, which is therefore a very important symptom. *Hydropericardium*, or "water on the heart," *hydrarthrus*, or effusion into a joint, *hydrorachis*, which is seated in the spinal canal, and *hydrocele*, in the scrotum, are forms of dropsy. Ovarian dropsy or ovarian tumor is a fluid collection occurring in ovarian cysts, which may be unilocular (of one sac) or multilocular (composed of many aggregated cysts), the whole frequently forming a mass of enormous size. Thus far, its only successful treatment consists in the removal of the cysts by excision, one of the boldest, and, on the whole, one of the best, of the more recent surgical operations.

Drown'ing, death by long-continued submersion in water. The recovery of persons after apparent death from drowning is a very important subject. The following rules are derived from the experience of

the best physicians: (1) It is necessary in all cases to keep the body cool until respiration be re-established, since the application of warmth (both in frozen and nearly drowned persons) seems to arouse those dormant energies that absolutely require the aëration of the blood, which failing, death ensues. (2) Respiration must be artificially established, either by direct inflation of the lungs by the breath or the bellows, or, much better, by the "Marshall Hall method" or some of its modifications. The patient being in a horizontal position to facilitate the exit of water from the lungs, and the head being slightly raised, the lungs are alternately inflated and compressed by gently rolling the body from a prone to a half-prone position (upon one side), and reversing the process. The lungs may also be inflated by retracting the arms with some force, and by pressure upon the thorax. (3) Expose the face and chest to the air, unless the weather be very cold. (4) Rub the limbs upward, and put dry clothing upon the patient. (5) Avoid the use of the galvanic battery, which is always dangerous, even in experienced hands. (6) Continue these operations until, if possible, natural respiration be re-established. Cases are reported where artificial respiration had to be kept up for hours before signs of life appeared. Similar treatment should be employed in all cases of so-called "asphyxia" from whatever cause.

Duchenne's Disease. See TABES DORSALIS.

Dys'entery [Gr. *δυσεντερία*, from *δύς*, "ill," "painful," and *έντερά*, "intestines"], a febrile disease, characterized by paroxysms of pain in the bowels, and by scanty though often frequent bloody, mucous stools. The glands and tissue of the large intestine are inflamed, and sometimes, though rarely, the small intestine shares the disorder. It may be acute or chronic, and is a frequent and formidable disease, especially in hot climates. It is sometimes epidemic, and then is peculiarly fatal among children. Many times it attacks and decimates armies. Sporadic cases in civil practice usually recover with little treatment. Pain is relieved by opium or Dover's powder. Gentle purgatives, as rhubarb or salines, are extremely useful. Enemata of warm water will often relieve tenesmus. Astringents, copaiba, opiated starch injections, etc., are useful adjuvants in some cases. Opium and belladonna are given as suppositories. Perfect rest on the back is desirable.

Niemeyer regards epidemic dysentery as a disease distinct from the common or sporadic disease. He considers it truly infectious. The severer cases of this disease are not much benefited by treatment. Even the

mild cases are apt to assume a chronic form, which may prove fatal. This disease is akin to cholera, and perhaps to intermittent fever. It is endemic in Southern Europe. The endemic dysentery of Egypt is a distinct disease, caused by the presence of a trematode worm (the *Bilharzia hamatobia*) in the walls of the intestine.

Dyspep'sia [Gr. *δυσπεψία*, from *δύς*, "difficult," and *πέπω*, to "digest"], a disordered functional state of the stomach without appreciable organic disease; indigestion of food, with the resulting symptoms, such as flatulence, pyrosis, pain, etc. Dyspepsia may be the forerunner or concomitant of consumption or of Bright's disease, but it is much more frequently the result of improper habits with regard to food, exercise, etc. Dyspepsia exists in two forms: (1) Irritative dyspepsia; (2) atonic dyspepsia, a debility of the stomach. In cases where the coats of the stomach are irritable, bismuth is a standard, safe, and useful remedy. The mineral acids, as the nitro-muriatic, are believed to correct depraved secretions. The hyposulphites are sometimes useful where microscopic plants (*Sarcina* and *Torula*) exist in the stomach. Rhubarb with alkalies, followed by sulphate of quinia, is frequently beneficial. The bitter tonics tend to correct gastric atony.

When there is no gastric catarrh or ulceration there is great, and often complete, relief obtained by sea-bathing, nutritious food, and the administration of iron. Dyspepsia with depression of spirits and a red uric-acid deposit in the urine is often cured by water-treatment, with visits to saline mineral springs. (See INDIGESTION.)

Ear, Diseases of. The ear is divided into three parts: 1. The external ear, including the auricle and external auditory canal; 2. The middle ear, including the drum or tympanum, the mastoid cells, and Eustachian tube; 3. The internal ear, including the labyrinth and auditory nerve. Any of these structures may be diseased. The auricle, or external ear, may be wanting, imperfect, or deformed. The auditory canal may be congenitally closed, or contracted either at its orifice or throughout its length. Supernumerary auricles sometimes exist. The auricle is subject to cutaneous eruptions, both acute and chronic—herpes, impetigo, eczema, erysipelas. The auditory canal is frequently the seat of foreign bodies, as in children, who put beads, buttons, etc. in the ear, or when insects, as bugs and bees, enter the ear. The canal, however, is chiefly obstructed by *cerumen*, or ear-wax, which may accumulate in great quantity, so as to occupy and occlude the entire passage, and exclude sounds. It may press

on the tympanum (drum of ear). It is a most frequent cause of deafness. Cerumen is to be removed by the surgeon with forceps or probes, and also by the ear-syringe and warm water or weak alkaline solutions. The auditory canal is frequently the seat of little abscesses or "boils in the ear." They are painful, though not dangerous. For a time they occlude the passage and cause partial deafness, which subsides with the pain when the abscess discharges. The treatment should be warm poultices and fomentations to the region of the ear, leeching in severe cases, and free use of sweet oil and laudanum in the ear until the abscess breaks. If the abscesses tend to re-form frequently, or a chronic discharge remains (otorrhœa), an aurist should be consulted, who will apply nitrate of silver or other healing remedies to the ulcer or granulations from which the pus flows. In scrofulous children this discharge (*strumous otorrhœa*) cannot safely be suddenly checked by astringent injections or local applications, as inflammation of the mastoid cells, disease of the inner ear, and death of a part of the temporal bone, with secondary brain disease, may be the results. Strumous otorrhœa should be treated cautiously, while the system is being corrected by nutritious food, cod-liver oil, iodine, iron, and tonics generally. Otorrhœa sometimes develops polypi, which occlude the meatus and require surgical removal. Exostoses, bony growths, sometimes project into the canal. The membrana tympani, or drum of the ear, may be injured by the introduction of sharp instruments, or ruptured by sudden impaction of air compressing it from without, as by a box on the ear, the noise of a loud explosion, as of blasting, cannon, or even firearms. It may also be ruptured by air from the throat through the Eustachian tube suddenly and forcibly pressing from within, as in violent blowing of the nose, vomiting, and paroxysms of whooping cough. Such ruptures usually heal. The membrana tympani is liable to congestion and to acute and chronic inflammation. If temporary, congestion and inflammation may leave no deafness, but in proportion as the drum is thickened and hardened the hearing is impaired or lost. The drum may grow hard and scar-like or be the seat of chalky masses. It is frequently inflamed by the extension of disease from the throat through the Eustachian tube, as in chronic catarrh, acute tonsillitis, diphtheria, scarlatina, and measles. The tympanum is quite apt to be ulcerated, and permanent perforation of the drum, external otorrhœa, and deafness result. The perforation may be minute or include nearly the whole drum. Often, if the Eustachian

tube be not closed, the person can blow air from the throat through the perforated drum into the external auditory canal, with a perceptible sound. An artificial drum or membrana tympani of hard rubber can be worn. It is introduced daily by the patient after cleansing the ear, and restores the hearing very perfectly in many cases. Moistened cotton wool, introduced clean each day, effects the same result in a measure. The auditory canal and drum may be covered with a yellow mould, minute fungi (*Aspergillus*), which can be removed by a weak solution of carbolic acid and sulphate of soda. The Eustachian tube is liable to be occluded by catarrhal thickening of its lining membrane, the product of catarrhal throat troubles. This is the explanation of the most frequent form of deafness—catarrhal deafness. Air does not gain access to the inner side of the drum of the ear. The Eustachian tube is to be restored to its open state by means of the Eustachian catheter or Politzer's bulb. The ossicles—the chain of little bones in the inner ear which transmit the sound-vibration of the tympanum to the auditory chambers—may become thickened or necrosed, or so firmly united (ankylosed) that they cannot move. The labyrinth—semicircular canals and filaments of the auditory nerve—may be the seat of inflammatory and degenerative changes causing deafness. In Meniere's disease giddiness, staggering, and vomiting coexist with decreased hearing, and are supposed to be due to blood-serum or pus in the semicircular canals. Often the deafness is associated with symptoms of cerebral disease, which indicate that the auditory nerve is involved at its origin or course in the brain.

The chief diseases of the ear are these:

1. Deafness; 2. Otorrhœa, or purulent discharge from the ear; 3. Otalgia, pain in the ear, the result of abscess or acute catarrh or inflammation, and often reflex or sympathetic, dependent on sore throat, or, again, a pure neuralgia, with no existing ear disease, caused by poor health, impoverished blood, or nervous and hysterical temperament. (See DEAFNESS.)

Ec'zema [Gr. ἐκζέμα, an "eruption," from ἐκ, "out," and ζέω, to "boil"], commonly called **Salt Rheum**, a vesicular disease of the skin, characterized by watery blisters smaller than those of herpes and larger than ordinary sudamina. Eczema is often accompanied by intense itching, and is frequently transformed into a pustular or scabbing disease. It is generally chronic. Its treatment is both local and general. The local treatment, when the epidermis is thickened, is by alkaline applications, with or without tarry or astringent admixtures. The "benzoated ointment of

oxide of zinc" is an excellent application. If the system has received a specific taint, the iodides, with mercury judiciously used, are indispensable, and produce the happiest results. Arsenic in small doses is an extremely useful tonic in many cases. Change of air and visits to thermal and other springs and baths, though not strictly curative, often appear to be wonderfully palliative.

Elephantiasis [from the Gr. *ἐλέφας*, an "elephant," because it was fancied that the legs of those who suffered with it resembled those of an elephant], as at present used, designates the disease anciently known as *elephantiasis Arabum*, the "elephantiasis of the Arabians," so called to distinguish it from the *elephantiasis Græcorum*, the "elephantiasis of the Greeks," which was probably identical with leprosy. Elephantiasis is rare in Europe and North America, though not unknown in either. It is endemic in the Levant and the East and West Indies. The foot and leg, or sometimes other parts, become greatly enlarged and enormously increased in density and hardness, the skin assuming a remarkable roughness and usually a darkness of hue. The prognosis is usually grave, very few cases recovering, though many cases remain completely stationary after the disease is once established. In fatal cases suppuration and erysipelas are the active symptoms. The treatment is thus far unsatisfactory. The use of iron, iodine and quinia, with bandaging, is recommended.

Embolism [Gr. *ἐμβολισμός*, from *ἐν*, "in," and *βάλλω*, to "throw"], in pathology, is the presence of a clot (*embolus*) in the arteries or veins. Some writers also apply the name to the fixed venous clot (*thrombus*). Embolism in the brain is a recognized cause of hemiplegia and of an apoplectic form of seizure in many respects identical with the phenomena of true apoplexy or cerebral hæmorrhage. An extensive embolism of the lungs may lead to sudden death; a smaller one may lead to local pneumonia, abscess, pyæmia, or gangrene. Embolism, though frequently fatal, is sometimes followed by recovery.

Endocarditis [from *endocardium* and the termination *-itis*, denoting "inflammation"], an inflammation of the endocardium. It is generally of rheumatic character, and, though not often immediately fatal, it is a frequent cause of organic disease and deformity of the heart and its valves. It is frequently associated with pericarditis, and its occurrence is one of the results always to be feared in rheumatic fever. It is usually attended by pain or discomfort about the heart, and is detected by auscultation. It produces peculiar murmurs in the heart,

the significance of which can only be appreciated by the trained physician. The disease is very intractable. Sedatives, such as hydrocyanic acid, belladonna, aconite, and digitalis, may be useful in acute stages. The alkaline treatment for rheumatism is often advantageous. Salicylic acid and salicylate of soda are the most recent and effectual remedies. Patients sometimes, though not very frequently, entirely recover.

Enteralgia [from the Gr. *έντερον*, the "intestine," and *άλγος*, "pain"], a name given in some medical works to colic, especially of the form attended by spasmodic contractions in the muscular coat of the intestine. The disease is best relieved by hot applications, anodynes, hypodermic injection of morphine, and by the cautious use of chloroform. The tendency of late writers is to limit the use of the term *enteralgia* to cases of NEURALGIA (which see) of the intestines.

Enteritis [from the Gr. *έντερον*, "bowel," "intestine," and the termination *-itis*, denoting, in modern medical nomenclature, "inflammation"], an inflammation of the small intestines. Active inflammation of the bowels, in adults at least, is frequently confined to the peritoneal coat, and the disease is hence called peritonitis. When the mucous coat of the bowels alone is actively involved, it is frequently a fatal disease in children, but in adults, with care, the majority of cases recover. Catarrhal enteritis is benefited, and generally cured, by gentle purgation. But in active disease of this kind cathartics will often greatly aggravate the evil. Such cases are best treated by rest, opiates, poultices to the abdomen, and bland nourishment. "Typhlo-enteritis" or inflammation of the cæcum, when caused by abscess or perforation of the appendix cæci, is not unfrequently fatal; when otherwise caused, recovery is to be looked for.

Epilepsy [Lat. *epilepsia*; Gr. *ἐπιληψία*, from *ἐπί*, "upon," and *λαμβάνω*, to "take," to "seize"], a disease of the nervous system, in which there are occasional seizures or fits of sudden and complete loss of consciousness, usually associated with convulsions, which become clonic, and finally impede respiration. The attack may last from two to twenty minutes, and is followed by exhaustion and sleep. In other cases, called *petit mal* (Fr. for "little sickness"), the loss of consciousness is but momentary, and there is no convulsion or falling down, as in ordinary attacks.

It has been customary to say that this disease is merely functional, because in most cases there is little or no apparent organic change of the brain observable

after death; but the present opinion of pathologists appears to be that sufficiently careful observation will detect lesions, however minute, sufficient to account for the symptoms. Dilatation of blood-vessels in the medulla oblongata is frequently observed. The disease itself is of a frightful character, apart from the unhappy effects it may produce upon the mind of the patient.

When occurring in childhood, and especially during the period of dentition, it may after a time be spontaneously cured. It is sometimes hereditary, and often is caused by various excesses, by blows on the head, or by excessive fright.

The treatment during the paroxysm, if it be habitual, is simply to place the patient where he cannot hurt himself, to loosen his clothing, and give him plenty of fresh air. Between the paroxysms the patient should avoid all excesses of eating, of drinking, or of any other kind. Systematic exercise, and even gymnastics, never carried so far as to produce much weariness, are often beneficial. Nutritious food, with avoidance of coffee, tobacco, and stimulants, is usually advisable. Of medicines, the bromides of potassium and of ammonium are useful in warding off the attacks, and the continuous use of the bromides for a term of one or two years will effect a cure in many cases. Tonics, such as iron, arsenic, and quinia, are useful in special cases, but in others are apparently worse than useless.

Notwithstanding the terrible effects of this disease upon the minds of many of its victims, not a few distinguished men have been epileptics, as were Cambyzes, Cæsar, Mohammed, Petrarch, Henry IV. of England, Napoleon, and Byron. The ancients, it is said, sometimes called this disease *morbus basilicus* ("king's disease"), from the idea that great men were especially liable to it; and among its numerous names was *morbus sacer* (the "sacred disease"), because the gods were believed to have especial care over its victims.

Epistaxis. See NOSE-BLEED.

Erysipelas [Gr. *ἐρυθρίλας*, probably from *ἐρυθρός*, "red," and *πέλος*, akin to the Lat. *pellis*, "skin"], a disease probably of miasmatic origin, sometimes associated with a peculiar rose-colored eruption of the skin, whence the name. The inflammation attending this disease is of a peculiar low type which is but little understood. It may terminate favorably by resolution, less favorably by abscess (which is apt to be diffuse—i. e. not limited to a single spot—and is then very dangerous), or the termination may be in gangrene and the death of the patient. The disease is very common in military hos-

pitals, seating itself in wounds, when it proves frequently fatal. Erysipelatous diseases sometimes assume an infectious and almost an epidemic character. Puerperal fever, peritonitis, phlebitis, and a long catalogue of diseases of low type are akin to erysipelas. Its infectious character is admitted. The famous old "Dreadnaught" hospital-ship in the Thames became so poisoned by it that she had to be destroyed. The best treatment is a sustaining one. Pure air, a milk diet, and the use of quinia and iron, with stimulants, are in general indicated. The sulphites and other disinfectant remedies may be employed. Externally, it is safest to use only the blandest applications—carbolyzed lotions, lead and opium wash, etc.

Eye, Diseases of. See articles AMAUROSIS, GRANULAR LIDS, BLINDNESS, CATARACT, MYOPIA, SQUINTING, OPHTHALMIA, SIGHT, DEFECTS OF, etc.

Facial Neuralgia, paroxysmal pain in the head and face. The cause of the neuralgia is a morbid state of the nervous centre giving origin to the nerve (trigeminal); and this morbid state may itself be the result of simple malnutrition (anæmia), of blood-poisoning (malaria), of inherited predisposition, of irritation of other sensitive nerves (bad teeth), tumors pressing on the nerve, and inflammation of the nerve itself. Remedies are anodynes and external use of hot water and soothing lotions.

Facial Paralysis, a paralysis of the superficial muscles of the face, due to a loss of the motor property of the nerve supplying them—the seventh or facial nerve. The symptoms are loss of expression on the affected side of the face, a drawing of the mouth and features, generally to the opposite (healthy) side, inability to close the eyelids on the palsied side, slight impairment in articulation, owing to palsy of a part of the muscles of the tongue. When both sides of the face are palsied, the face appears like a smooth mask, the mouth (lips) is open, the eyes cannot be closed. The pathological conditions which produce this palsy may be disease of the cerebrum, pons Varolii, or of the medulla oblongata, pressure upon the nerve in the skull or in the canals in the petrous bone, injuries to the nerve in these locations or upon the face, or the sudden impact of cold air upon the face (draught).

Fainting (*Syncope*), a more or less complete and sudden loss of sensation and of the power of motion, usually attended by feebleness of the circulation and respiration. Fainting is due to anæmia of the brain, its proximate cause; more remotely it may be caused by loss of blood, by profound emotional disturbance, or by heart disease. In

profound and protracted syneope there is danger of death by heart-élot. Fainting is to be treated by placing the patient on his back in a horizontal position, or with the head and chest slightly depressed below the level of the rest of the body; by admission of fresh air to the patient; and, in prolonged cases, by applying diffusive stimulants—as ammonia, camphor to the nostrils, alcoholic stimulants by the mouth and rectum, and resorting to artificial respiration and the electric battery. Fainting is seldom fatal, unless in cases of severe disease.

Fall'ing of the Fun'dament. See RECTUM, DISEASES OF (prolapse).

Fall'ing of the Womb. See PROLAPSUS UTERI and UTERINE DISEASES.

Far-Sightedness. See SIGHT, DEFECTS OF.

Fat'ty Degenera'tion, in pathology, a condition in which the minute structural elements of the tissues of living organisms are gradually replaced by fat-globules. In man this diseased condition has been observed in nearly all the tissues, though some authorities state that the nerves and the red corpuscles of blood are not liable to this change. Fats, though always of organic origin, and often closely associated with living tissues, are never, it is believed, truly organized bodies; and consequently they are not regarded as ever truly vitalized, any more than are the water and the lime which are found in living organisms. In this view, fatty degeneration is a molecular death of the tissues.

In the liver at first it is merely an excess of the normal fatty element, which, however, encroaches upon the organized elements of those structures, and becomes a true fatty degeneration. It attacks the muscles, the heart, the bones, the brain (yellow softening), the cornea (*arcussenilis*), and the kidney in many cases of so-called Bright's disease.

Fa'vus [Lat. "honeycomb"], or **Scald Head** (*i. e.* "scabby head," from *scall*, a "scab"), a disease formerly known as *tinea* and *porrigo*, generally seated on the hairy part of the scalp, but sometimes attacking the roots of the nails and other parts. This disease is caused by a parasitic vegetation. These fungi are known as *Achorion Schoenleinii* and *Puccinia favi*, but are now believed to be aberrant forms of the species known as the yeast-plant, *Cryptococcus cerevisie*. Favus is a contagious disease, best prevented by cleanliness, and best cured by carefully removing the hair and applying parasiticide medicines, such as have the power of destroying low organisms. Sulphurous and carbolic acids and weak solutions of corrosive sublimate are the best applications. It leads to permanent baldness.

Febrie'ula [a diminutive of the Lat. *febris*,

"fever"], or **Ephem'eral Fever**, a short feverish attack lasting from one day to a week, marked by a rapid pulse, a furred tongue, and often by a very considerable increase of heat and by headache. Persons suffering from febricula are said to be "threatened with a fever," and are too often improperly dosed. A warm bath, warm or cold water to drink as best suits the patient, the use of enemata if called for, and other simple treatment is sufficient, for the disease will pass away of itself if allowed to do so. It is often followed by an eruption or a stage of profuse sweating. Febricula may be associated with a severe cold, a profound emotional disturbance, or with some excess on the patient's part. It is especially common during epidemics of typhoid and typhus fevers.

Fel'on. See WHITLOW.

Fe'ver [Lat. *febris*, allied to *ferveo*, to "glow," to "be hot"]. In distinction from other diseases, which, however grave or extended, are confined to certain organs, fever may be said to be a perversion of all the physiological functions. Fever occurs in a great variety of forms and different degrees.

The early symptoms are a sensation of general *malaise*, bodily and mental languor, headache, pains in the back and limbs, loss of appetite, accelerated pulse, and *chill*; after a certain length of time a sensation of *heat*, not merely felt by the patient himself, but also by others. The skin feels hot and dry, the pulse remains quick, but is fuller, the respiration is hurried and irregular, the general restlessness becomes very great, the thirst intense, the appetite is wholly lost, the tongue is coated with a whitish film, the mucous membrane of the mouth and throat is dry, the urine is scanty, of a deeper color but clear, and of a greater specific gravity. After this stage of dry heat there is profuse sweating, the dryness of the mouth and the thirst diminish, the respiration becomes deeper, more regular, and less frequent, the pulse soft.

Not all the symptoms just described must necessarily be present to pronounce a certain condition of the system as febrile in character.

One symptom is never wanting in fever, which can be measured with mathematical exactitude, which always keeps in true relation to the degree of the fever: it is the *increase of the temperature* of the body as determined by the thermometer. It varies from 98.5° F. (normal temperature of the body) to 108° F., or a little more (37.5° to 42° C.). There is no more certain and trustworthy guide to a correct judgment of the dangers threatening health and life from

fever than the thermometer, and it is now universally adopted by the medical profession as a means of diagnosis and prognosis in fevers.

Fevers are *idiopathic* (primary) and *symptomatic* (secondary). Idiopathic fevers are also called *essential* fevers. All zymotic fevers, be they contagious or miasmatic, belong to this class. Symptomatic fevers require a local disease as a preceding condition. Such are inflammatory, catarrhal, rheumatic, hectic fevers; also all fevers named after the organs whose diseased condition causes them—brain, lung, gastric, enteric fever.

Contagious and infectious fevers are the result of peculiar substances, which get into the circulation either from the air we breathe or in food and drink. Secondary fevers are generated in a similar manner, the local diseases producing some substance which, absorbed, contaminates the blood in such a way that fever must follow. (The more important varieties of fever are described, with their treatment, under their alphabetical heads.)

Fever and A'gue. See INTERMITTENT FEVER.

Fistula [Lat., a "pipe"], a term used in pathology to designate an abnormal canal, usually of small length and diameter, leading from one organ to another (vesico-vaginal fistula), or from some cavity of the body to the external world (gastric fistula, fistula in ano).

Fistula is called (1) complete, when it has two orifices; (2) incomplete or blind, when it has only one; (3) external, when the opening is through the skin; (4) internal, when it opens only into a cavity of the body. The two most prominent characteristics of a fistula are the constant discharge from it of a thin purulent fluid, with which the secretions of the organ affected are mixed, and the obstinacy with which it resists the healing process. This latter results from the nature of the wall of the fistula, which in recent cases is formed of soft, unhealthy granulation-cells which have no tendency to unite to form either cicatrix or cuticle. In older cases the walls consist principally of condensed connective tissue, inseparable from the surrounding parts. A fistula of long standing also exerts a change in the tissues through which it passes, these becoming more dense, and finally indurated, and the integument around its orifice callos and sometimes warty.

Fistula is caused (1) by wounds which penetrate passages giving natural exit to the secretions, or those which follow a long and deviating course through many tissues; (2) by ulceration and the sloughing process;

(3) by abscess. The last is the most frequent cause.

The passage of a bullet through any region of the body sometimes leaves a canal which fails to unite; and whenever a necrosis of bone occurs there are usually one or more tracks following a winding course from it to the outside of the body. These passages are often called fistulae, but the more appropriate name for them is *sinus*.

Fistula commonly occurs in persons of an enfeebled constitution. Where it results from abscess it is more frequently the chronic than acute form which gives rise to it. Fistulae were formerly supposed to furnish exit for morbid humors, and surgeons hesitated to attempt their cure. At the present time some surgeons refuse to operate on a fistula in ano in a patient having phthisis.

The cure of fistula depends upon producing union of its walls through the agency of healthy granulation-cells. This may be brought about by stimulating applications, as the injection of nitrate of silver, corrosive sublimate, etc. in solution, or the application of the red-hot iron. Where the walls are old and indurated, it is necessary to dissect them out and remove them altogether, bringing the lips of the wound together by sutures.

Fit. See CONVULSIONS, APOPLEXY, and EPILEPSY.

Flatulence, the accumulation of gas, the product of fermented food, in the stomach, consequent upon indigestion (see INDIGESTION and DYSPESIA), or in the intestines, where it is detained by feces. (See CONSTIPATION.) Flatulence causes gurgling or rumbling sounds in the bowels, and may be voided by belching of wind by the mouth or downward from the rectum. It is the frequent cause of colic or intestinal cramp. (See ENTERALGIA and COLIC.) When habitually present, it dilates the bowels and creates a large abdomen. The appropriate remedies are those detailed in the treatment of indigestion and constipation.

Flu'or Al'bus. See LEUCORRHOEA.

Frac'ture [Lat. *fractura*, from *frango*, *fractum*, to "break"]. In surgery, the term fracture is used to indicate a rupture, or solution of continuity, occurring in osseous tissue, or in rare cases in cartilaginous tissue partly ossified. By *simple* fracture is meant one in which no wound exists admitting air to the seat of fracture. A *compound* fracture is one in which such a wound does exist. A *complicated* fracture is one in which some other serious injury is inflicted, at or near the site of the fracture, or in which, from the situation of the rupture, the healing process cannot progress as favorably as is usual;

as when a large blood-vessel or nerve-trunk is torn by the broken bone, or when the fracture extends into a joint-cavity. A *comminuted* fracture is one in which the bone is broken into several small pieces at the point of rupture, and is rarely produced except by direct violence, as by a blow or crushing force. A *complete* fracture is one in which the rupture extends through the whole thickness of the bone, while if only a portion of the fibres are broken, as sometimes happens in children, the fracture is called *incomplete*, or the "green-stick fracture" of some writers, from its resemblance to the fracture produced by bending a stick of green wood until some of the fibres give way. The terms *transverse*, *oblique*, and *longitudinal* refer to the direction of the rupture in relation to the long axis of the bone, the great majority of the fractures of the long bones belonging to the second class. The term *stellate* is applied to a series of fractures radiating from a centre, as seen sometimes in fracture of the skull from a wound produced by a pointed instrument.

Causes of Fracture.—These may be *external*, from violence adequate to break a normal bone, or *internal*, the bone being too fragile to resist ordinary forces. External causes embrace *direct violence*, where the rupturing force is applied opposite the point where the bone breaks (as a blow or crushing force which fractures the bone at the point of contact); and *indirect violence*, where the bone is bent beyond the power of its elasticity to restore itself, and gives way, usually at some distance from the point of application of the fracturing force (as when a fall upon the shoulder fractures the collar-bone). *Muscular* force is generally acknowledged as a cause of fractures, especially in particular situations—*e. g.* fracture of the point of the elbow or of the knee-pan. The *internal* or predisposing cause is a brittleness of the bones called "fragilitas ossium," which occurs sometimes in early or middle life as a result of disease (although it may occur in those otherwise healthy), and almost universally in advanced life from the preponderance of earthy and deficiency of elastic matter.

The signs of fracture are *pain*, *swelling*, and *tenderness* at the point of fracture, *change in shape* of the limb, *false point of motion*, and *crepitation*, though any, or even all, of these signs may be absent. The pain comes from laceration of some nerve-filaments and pressure upon others by the broken bone, or by the blood escaping from torn vessels, which gives rise to the swelling that occurs at first, the subsequent swelling being due to products of inflammation or of the reparative process. The change in shape

is due partly to this swelling, and partly to displacement of the broken bones either by muscular action or by movements of the patient. The false point of motion comes of course from the want of continuity of the bone, and the crepitation is a fine grating elicited when the ends of the broken bone are gently rubbed together, and which may be appreciated by the ear or touch. If the fracture be *impacted*—that is, if the broken ends are firmly locked together, as sometimes happens—none of these signs may be present in a marked degree, and some of them, such as crepitation and false motion, not at all.

Fractures generally unite by the deposition of bony material between and around the broken ends of the bone, forming an exception to the rule that prevails for most other structures, that union after rupture is effected by means of fibrous or connective tissue; and the reason is apparent, since fibrous tissue does not form a sufficiently rigid bond of union to enable the bone to perform its functions, as we see in cases of so-called "ununited fracture," when the union is of a fibrous nature. The union of a simple fracture consists of two processes—one to accomplish a temporary purpose, the other for the permanent union; the former to support and bind together the fragments, while the latter consolidates them. A few days after the fracture the bone, its periosteum (membrane surrounding the bone), and the neighboring tissues pour out a quantity of plastic material around and between the broken ends, which gradually hardens, and at the end of the fourth week consolidates the fragments. This is called the "provisional callus," and the hardening process continues until it is converted into bony tissue. The plastic material effused *between* the fragments is much slower in ossifying than that which is internal or external to it; and this, which is destined to form the permanent bond of union, is called the "definitive callus." While the definitive callus is forming the provisional callus is gradually being absorbed; and finally, many months after the fracture, the provisional callus entirely disappears, and the fragments are united by the definitive callus alone, which is true bone; and the site of the fracture may be indicated only by a slight enlargement at that point. The union of *compound* fractures is entirely different. In these the provisional callus is almost or quite absent, and the definitive callus is formed by a process of granulation from the ends of the fragments, the granulations being gradually converted into bony tissue. It is a process requiring several months, or sometimes years, and is attended with a

greatly increased amount of danger from exhaustion through long-continued suppuration and absorption of purulent material. The difference in the mode of union seems to be due to the irritation produced by the air, or something conveyed by the air to the wound.

The *treatment* of fractures consists essentially in restoring the fragments to their original position, and holding them there by some form of rigid apparatus which shall not cause discomfort or injury to the patient. Of course general treatment is to be employed also if the circumstances require; but simple fracture in a healthy individual requires no special medication or system of dieting, as the old modes of practice were wont to inculcate. The rigid apparatus used to retain the fragments in their proper position is called a splint, which consists of two kinds—padded and moulded. If the splints are made of straight, inflexible material, they cannot be adapted to the irregularities of the limb without more or less padding at certain points; while if made of material which at the time of its application is soft and pliable, it may be moulded to the shape of the limb, and, becoming hard and rigid, will serve to support and retain the fragments. Splints of the first variety are made of wood, sheet iron, tin, zinc, etc., while gutta-percha, felt, sole leather, starch, soluble glass, or plaster of Paris are used for the second class. Fractures sometimes fail to unite, and are called ununited fractures. This may be the consequence of faulty position of the fragments, or of something interposed between the broken ends, impeding union, but it more frequently arises from some constitutional defect. The location of the fracture may prevent union, especially if either fragment be poorly supplied with blood, as in certain fractures of the neck of the thigh-bone, which frequently unite only by fibrous tissue. Ununited fractures may often be made to unite by irritating the parts at the site of fracture, as by rubbing the bones together, drilling them by means of a long needle, or by wiring the bones together.

Frost-bite and **Free'zing** are conditions caused by the action of cold upon the animal economy. Frost-bite is local and partial—freezing is general and more or less complete. Severe frost-bite may lead to gangrene, but the milder forms often result in nothing worse than chilblains, which are very annoying, but not dangerous. General freezing, if rapid, may result in speedy death; but more frequently the vital functions pass for a time into a state of abeyance, which may last, it is said, for some days, and then be terminated by death. In

recovering frozen and unconscious persons it is held that a very slow restoration of the normal temperature is safest, apparently because sudden warmth arouses those dormant energies which demand immediate aëration of the blood, which failing, death at once ensues.

Fu'runcle. See BOIL.

Gall Stones. See CALCULUS.

Gan'grene [Gr. γάγγραινα], the death, or partial death, of an organ or any portion of the body. Debility from any cause, and especially from old age, is the great predisposing agency. Among the exciting causes may be mentioned mechanical injuries and obstruction either to the ingress of arterial blood to, or egress of venous blood from, a part. The immediate cause of the death of a part is always the complete cessation of the capillary circulation in it. A distinction is generally made into *wet* and *dry* gangrene, according to the condition of the part affected. Another division is into *constitutional* and *local*. Gangrene usually begins with a diminution in the sensation and temperature of the part, the cuticle becomes detached, and a serous fluid is found beneath it. The limb crackles under the finger, owing to the presence of gases which are evolved by the decomposing tissues. These symptoms increase until all sensation is lost, and the part becomes colored greenish-black by the sulphuretted hydrogen set free during the process. The treatment must necessarily vary according to the cause. The system should be supported, and inflammation, if present, allayed. If there be any chance of saving the part, the temperature should be kept up by warm fomentations.

Gid'diness. See VERTIGO.

Gleet, the chronic stage of urethritis, deeply seated and most difficult of cure. (See GONORRHEA.)

Goitre (*gutter*, the "throat"); synonyms, **Bronchocele**, **Derbyshire Neck**. This is an enlargement of the thyroid gland, which lies across the front of the windpipe. It probably originates in hypertrophy of the natural gland-structure, and the concurrent formation of cysts in the interstices of the gland-tissue. These cysts are of varying size, and generally contain a more or less solid glairy matter, blood, earthy concretions, etc. The disease has been supposed to be due to the drinking of snow-water, but it occurs where there is no snow. Although manifesting itself to a greater or less extent in all parts of the world, it is more prevalent in the chalky parts of England, especially Derbyshire and Nottingham, and in mountainous districts, among which may be named the Himalayas, Andes, Alps, the Tyrol, and the valley of the Rhône. It

is seen upon almost all cretins. Goitre is also a symptom of a peculiar affection known as GRAVES' or BASEDOW'S DISEASE (which see), which consists, besides the enlargement of the thyroid gland, of an unusual prominence of the eyeballs and a very rapid action of the heart. This tumor, called exophthalmic goitre, is not goitre at all, and usually disappears with the general disease. (Niemeyer). Unless it be very large, goitre causes but little inconvenience, but it often attains to such a size as to produce serious trouble by pressure on the neighboring important parts—the large veins, trachea, œsophagus, etc. The treatment usually adopted is iodine, both applied externally and administered internally, to cause absorption. Extirpation is sometimes performed. In India powerful mercurial inunctions are successfully employed.

Gonorrhœa [Gr. γονή, "semen," and ῥέω, to "flow," a misnomer], acute catarrh of the urethra, a disease which is usually of impure venereal origin. It is a painful disease, and may result in the chronic catarrh called *gleet*, or may lead to stricture, epididymitis, enlarged prostate, and other serious evils. Its treatment should be entrusted only to practitioners of the highest character. Quacks extort large sums of money from persons suffering from this disorder and its consequences. The most efficacious remedies are copaiiba, cubebs, and sandalwood internally, and local injections of bismuth, sugar of lead, and sulphate of zinc in weak solution. (See STRICTURE and GLEET.)

Gout [*goutte*, a "drop"], an inflammation of the fibrous and ligamentous parts of the joints, and is dependent upon mal-assimilation. It derives its name from having been thought to be produced by a liquid falling (*goutte à goutte*), "drop by drop," into the joints, and, although this theory has long since been proved to be erroneous, it still retains the name. We generally find an hereditary predisposition to this affection. It can be traced through many generations, and is found in about two-thirds of the cases. Next frequently we find it in persons enjoying the luxuries of the table, drinking wine and beer, and taking but little exercise. It was formerly considered a disease of high life, but is now just as common among the poorest people in England as among the rich. It was not so in Sydenham's time. The ballast-heavers of London have more gout than any other class in the world. They work in the water, and drink large quantities of malt liquors daily. The principal change observed in the blood is a great excess of uric acid, and the deposit in the affected joints is made up almost entirely of urates. But "we neither know whether

the uric-acid diathesis be the primary and chief anomaly in gout, and whether it be not accompanied by other and more important changes in the composition of the blood, nor do we know the disturbances of nutrition by which one of the constant products of normal nutrition, uric acid, is formed in excess." (Niemeyer.) We have certain symptoms premonitory to an attack of gout. The digestive apparatus is disturbed, and we find that the patient loses his appetite; he will also suffer from pain and a sense of weight or fulness in the region of the stomach, accompanied by acid eructations, heartburn, irregularity of the bowels, and flatulence. Sometimes he will vomit a phlegmy material. The patient now complains of a dull headache, and feels indisposed for any work, and becomes irascible. This last symptom is well known among the laity as a premonition of gout. The urine becomes highly concentrated; the specific gravity runs up to 1025–1030; it is of a deep amber or red color, and deposits on cooling large quantities of uric acid and the urates, which are commonly known as the "brickdust deposit." This concentrated urine often causes a burning and pain as it passes along the urethra, and has even been known to excite a mucopurulent discharge. Dr. Graves speaks of an unavoidable desire in these patients to grind the teeth, which is caused by painful sensations in the genital organs, and which seem to be relieved in no other way. To such an extent is this sometimes practised that we find gouty individuals with the teeth worn almost entirely away. The next symptom noticed is small sharp pains throughout the whole economy; this precedes the attack of gout but a few days. Now the attack begins, generally during the night, by a burning, piercing pain in the great toe, generally the metatarso-phalangeal articulation. The patients have different modes of expressing this variety of pain—some simulating it to the driving of a nail into the foot, others to the teeth of a dog crushing the bones or to having the toe squeezed in a vice. The patient tumbles and tosses from one side of the bed to the other, seeking a position in which he may get some rest; but this is denied by his visitor, who never lets go his grip for more than a couple of seconds at a time. At the end of three or four hours the pain has become almost intolerable, and is so severe that the patient cannot bear even the weight of the bed-clothes upon the affected part. Towards morning the pain diminishes, and the patient breaks out in a perspiration and falls asleep. The following day the affected joints are found to be red and swollen, but the pain is a great relief from that of the previous night; they con-

tinue in this way until evening, when the scene of the previous night is re-enacted. After a week of this suffering the patient is generally temporarily freed from his trouble; the redness and swelling gradually subside, and the upper layer of the skin peels off and itches greatly. The patient now feels better than he did before the attack. After repeated attacks the disease may degenerate into chronic gout, in which the attacks are quite frequent; there is a purplish appearance of the affected joints, and, owing to synovial effusions and deposits of lithate of soda, they are oedematous and deformed. Abscesses frequently form in or about the joints, and concretions of urate of soda may escape from them when opened.

Nervous gout, also called atonic, anomalous, or irregular gout, is a name given to a variety which occurs in persons of hereditary gouty tendencies, in whom the debilitated constitution is not in a condition to develop a normal attack of gout. It generally occurs in nervous and poorly-nourished individuals, and appears as dyspepsia, cough, etc., accompanied by palpitation of the heart, irregular pulse, dizziness, syncope, etc. It is this variety which sometimes proves fatal.

The only disease with which gout could be confounded is rheumatism, but it differs from it in the following points: "(1) Rheumatism affects chiefly the young or middle-aged; gout, the elderly. (2) Rheumatism prefers the larger joints; gout, the smaller, and especially the feet and hands. (3) Gout is attended with more obvious disorder of the digestive organs; the pain is of a more burning character, and the swelling greater and more vividly red."

The treatment may be divided into two stages—viz. that during the paroxysm, and that during the interval between the paroxysms. Colchicum is the favorite drug used to cut short the attack. If the pain is excessive it may be relieved by opiates. The bowels should be opened. Salicylic acid and salicylate of soda are beneficial. In the treatment during the interval between the paroxysms attention should be paid to the diet and regimen of the patient; he should take his meals regularly; should eat plenty of vegetables, meat but once a day, and should abstain from alcoholic drinks, especially ale and beer, and take a certain amount of exercise in the open air daily. The regular use of mild mineral waters, which are diuretic and laxative, tends to avert the attacks and to lessen or remove the constitutional taint. Particular attention should be taken to keep the bowels regular.

Gran'ular Lids. See OPTHALMIA.

Grav'el, a disease manifested by the formation of small concretions either in the kidneys or bladder, and their expulsion with the urine. They are generally composed of some of the salts of urine, and are deposited either on account of being in abnormal abundance, or in consequence of the urine not being of the proper reaction to hold them in solution. When they form in the kidneys, they sometimes cause the most excruciating pain when passing along the ureter to the bladder, giving rise to what is commonly known as renal colic. Gravel may be divided into three varieties, according to its composition—viz. (1) uric acid or red gravel (see LITHIC-ACID DIATHESIS); (2) oxalate of lime (see OXALURIA); (3) phosphatic deposits (see PHOSPHATIC DIATHESIS). Other rare varieties are mentioned in the art. CALCULUS (which see).

Graves' Disease. See BASEDOW'S DISEASE.

Green Sick'ness. See CHLOROSIS.

Grippe. See INFLUENZA.

Gun'shot Wounds, wounds produced by balls or other projectiles propelled by the force of an explosive, such as gunpowder, gun-cotton, or the like. They differ in some essential points from other wounds; they are generally accompanied by shock, and complicated by the presence of foreign bodies in the wound, such as the ball or projectile itself and pieces of clothing or accoutrements which the ball has carried with it and before it. Another element of their danger consists in the fact that they generally occur in large numbers—*i. e.* in war—when the accumulation of a large number of suppurating wounds gives rise to dangerous complications, such as erysipelas, pyæmia, and hospital gangrene; add to that, that in protracted wars the constitution of the men has already suffered by camp-life, bad diet, and exposure, producing typhus, dysentery, scurvy, etc. When, after the discovery of gunpowder, gunshot wounds first became known, surgery being then in its infancy, these wounds were looked upon as the result of some supernatural and malignant agency, and were therefore often treated by incantations and the like, or they were looked upon as poisoned either by the powder or the ball, and were treated with a view to destroy the poison—for instance, by pouring boiling oil into the wound. At the present day the treatment of gunshot wounds has become more simple and rational; even the extraction of the ball is no longer looked upon as of such absolute necessity as formerly. Still, some erroneous notions have prevailed till very recently. Thus, it was maintained that the wound of exit of the ball was always larger than that of entrance

Recent investigations have shown that the above is not true, and that the wound of entrance is often larger than that of exit. Another mistaken idea has prevailed with regard to what was called the "wind of the ball." Recent investigations have proved that a spent round-shot may roll over a part of the body when it touches at an obtuse angle like a wheel, crushing everything beneath the skin, without breaking or wounding the skin itself.

Taking a statistical view of gunshot wounds and their fatality on a large scale, we find that on an average the number of those killed outright on the field of battle to those wounded is about in the proportion of 1 to 5, and that of the wounded about 14 to 15 per cent. will die of their wounds. Thus, the number of killed in battle in the U. S. army during the civil war was 59,850. The number of gunshot wounds from May 1, 1861, to June 30, 1865, was 235,585; of the latter, 33,653, or 14.2 per cent., died of their wounds. The Confederate army lost 57,425 killed in battle, and had 227,871 wounded.

Hæmatemesis [Gr. *αἷμα*, "blood," and *ἐμέω*, to "vomit"]. Vomiting of blood, or hæmorrhage, from the stomach, is the result chiefly of ulcer of the stomach, cancer of the stomach, or extreme inflammation or congestion of the stomach, as when caused by corrosive irritants, excess of alcoholic drinks, or the presence of serious disease of the liver. Hæmorrhage from the stomach is to be distinguished chiefly from bleeding from the lungs and bronchi. Blood from the stomach is vomited; it is preceded or accompanied by food, gastric mucus, and gastric juice; it is brought up with a sense of nausea and straining; it often is changed by digestive juice to a dark, coffee-ground appearance; usually there is a pain or burning sensation over the pit of the stomach. Hæmorrhage from the stomach is treated by perfect rest on the back, cold packs over the stomach, bits of ice swallowed, preventing the swallowing of food or drink for some time, feeding by the rectum or cautiously by the mouth. Opiates or other anodynes may be administered by the rectum or hypodermically to check the tendency to vomit.

Hæmoptysis [Gr. *αἷμα*, "blood," and *πνέω*, "spitting"], the expectoration of blood from the vessels of the lungs or from the mucous membrane of the thoracic air-passages. Hæmoptysis occurs in pulmonary consumption, in heart disease, etc. It is sometimes vicarious in cases of suppressed menses. The significance of hæmoptysis in any case can only be estimated by the trained diagnostician. The remedies usually administered for hæmoptysis are di-

lute sulphuric acid, ergot, gallic acid, lead-acetate, opium, turpentine, common salt, and other hæmostatics. Perfect quiet of mind and body is to be sought. Ice to the chest and the swallowing of lumps of ice are often effective.

Hæmorrhage. See BLEEDING.

Hæmorrhage from the Lungs. See HÆMOPTYSIS.

Hæmorrhage from the Stomach. See HÆMATEMESIS.

Hæmorrhoids. See PILES.

Hair, Diseases of. See BALDNESS and BARBER'S ITCH.

Hay As'thma, Hay Fe'ver, or Autum'nal Catarrh, a disease recurring in certain individuals at certain seasons every year, as in June (rose cold), in the hay-making season (hay fever), or (in this country especially) in the autumn, whence the name autumnal catarrh. It is a catarrhal affection of the nasal (and sometimes of the bronchial) passages, often with some fever and more or less asthmatic spasm. Sometimes incessant sneezing and coryza are the only prominent symptoms. It is not observed in very hot or very cold countries, on the sea, or at considerable heights in some mountain-regions. It is very probably caused by pollen from some plants, but it is by no means certain of what species they are. Removal from districts where the disease prevails is the only means of cure, but the usual palliatives may be employed. The insufflation of quinine, either in powder or a saturated solution, at the inception of the disease, is claimed to cut short the specific catarrh while yet limited to the nostrils and fauces.

Head'ache (*Cephalalgia*) is of many kinds. It is often the result of indigestion, of excess in eating or drinking, of malarial or other specific poison, of uterine disease, or of neuralgia. It is also a common symptom of many fevers and other acute diseases. If persistent headache be not relieved by a correction of the hygienic conditions as regards diet, clothing, exercise, etc., the case requires medical treatment, the character of which must depend upon the probable cause of the difficulty. Opiates, chloral, pulvinaria, citrate of caffeine will deaden the pain; aconite, chloroform, and chloral camphor may be applied externally; aromatic spirits of ammonia, bicarbonate of soda, and laxatives are efficient when stomach disorder is the cause.

Hear'ing, Defects' of. See DEAFNESS and EAR, DISEASES OF.

Heart'burn. See CARDIALGIA.

Heart Diseases. Hypertrophy or enlargement of the heart is generally due to some obstacle to the circulation, re-

quiring increased strength of muscle to overcome it, as a diseased valve, or a tumor pressing upon a large artery, or a large organ so diseased that the circulation through it is seriously obstructed. It is produced by the mental emotions, which increase the force and frequency of heart-beats, as frequent anger and the anxieties that excite the heart. Its subjective manifestations are a strong impulse of the heart-beats and shortness of breath on exertion. The physician discovers it by many signs, the chief of which is the extension of dulness on percussion to the left of the line of the healthy heart. The heart, once enlarged, never returns again to its original size, and alone it rarely causes death. This usually is the result of secondary disorders, apoplexy or kidney disease, or it may wait for the intercurrent of other entirely distinct diseases.

Dilatation of the heart is an enlargement of its cavities. The left ventricle may be so dilated that its capacity is considerably greater than would be sufficient to contain the whole of a healthy heart. The dilatation may be in all of the four cavities, or may be confined to one. The ventricles are far more liable to dilatation than the auricles, and the left much more than the right. Dilatation and hypertrophy very commonly go together, so that eccentric hypertrophy or hypertrophy with dilatation, already explained, associated with and caused by morbid changes in the shape and function of the valves, is the most common form of heart disease. The conditions of the heart may be regarded as alternately active and passive—active in systole, passive in diastole. If in the passive state, while the blood is flowing naturally into a heart-cavity, there is at the same time a reflux of blood into the same cavity in consequence of a defective valve, dilatation of that cavity will be sure to occur. The extended wall of such a cavity may not be thicker than it is in health, yet as it bounds a greater space it will require more material, and is hypertrophied by multiplication of the muscular fibres. In this state the heart has been known to weigh sixty ounces, or six times its natural weight. Hearts like these are *enormitas cordis*, or *cor bovinum vel taurinum*. They are almost always found in persons who have had rheumatism and heart disease in childhood, and have grown to manhood with a damaged heart. It is noticeable that children bear these cardiac affections better than adults. The body, as it grows, seems to accept and tolerate an amount of such disease that would overwhelm a grown-up person. When it begins thus early, it is usually carried to manhood, and often to advanced manhood. It is the repetition of the attack which is

fatal in childhood. Dilatation with hypertrophy is, after it reaches a certain stage of progress, attended by shortness of breath on exertion, sometimes palpitations, irregular heart-beating, and consequently irregular pulse. Its chief danger is, however, an induced or secondary Bright's disease, with dropsical swellings of the legs and body; without which the common forms of heart disease are not generally fatal. There is a form of dilatation of the heart in which there is not only no hypertrophy, but in which the walls of one or all the cavities gradually grow thinner and thinner by fatty degeneration and absorption of the muscular tissue, till this tissue is almost wholly removed, and the walls are stretched and expanded in the effort to expel the blood from their cavities. But this is a rare disease, and may be passed with the statement that it is possible.

Simple *atrophy of the heart* (diminished size and weight) occurs only with wasting diseases; it should not be regarded as a disease.

Diseases of the Valves of the Heart.—*Endocarditis*, or inflammation of the lining membrane of the cavities of the heart, is a common attendant on acute rheumatic inflammation of the joints, but it may occur without rheumatism. This inflammation is one of the principal causes of derangement and imperfection in these essential appendages of the heart. Thus, endocarditis expends its force principally on those duplications of the endocardium which constitute the valves. It deposits a new material between their folds, and at first increases their thickness. A portion of this new material is converted into fibrous structure, and finally the fibres contract. The result is, that these valves become thick and unyielding, so that the semilunar cannot be applied to the arterial wall when the blood is forced into the aorta or pulmonary artery. The mitral and tricuspid grow stiff and hard, and do not fully give place to the blood passing from the auricle into the ventricle. Again, this new fibrous structure contracts and shortens the valves, so that their parts cannot meet properly and prevent the reflux of the blood. So blood from the ventricles sent into the great arteries will flow back again into the heart, to be forced out again by new contraction. This is *insufficiency*, or regurgitative disease of a valve. The stiff, unyielding state, when it obstructs the current, is called *obstructive disease of the valve (stenosis)*. The valves are thickened also by the deposit between their folds of a yellowish substance, made up partly of small microscopic cells, and partly of fat-globules, called *atheroma*, one of the products, it is be-

lived, of a slow or chronic inflammatory action. In time this atheromatous deposit is apt to be converted into, or rather is replaced by, a hard calcareous material, or even organized bone-structure. In the same way the least organizable portion of the deposit of acute inflammation (endocarditis) may slowly be replaced by the same material. This is the *ossification of the valves*. It is not a very frequent occurrence, and is limited usually to a small portion of a valve. But it does mischief, partly as an obstacle to the blood-current, but more by irritating these movable folds and keeping up chronic inflammation in them, and causing thickening, inflexibility, and shortening (just described), or increasing them if they have already occurred.

Rupture of the valves is possible. The aortic valve may yield in the bottom of one of its cups; or the marginal thread may separate from the deeper part of the cup; or the upper attachments of the cups to the aorta may give way; or the anterior leaf of the mitral valve may be perforated; or one or more of its tendinous cords may be broken. These accidents usually occur after the ruptured part has been weakened by the deposit in it of a plate of atheroma; yet they may yield without previous disease, but then always at the time of great exertion of muscular strength in lifting weights, running, jumping the rope, or the like. The reader may remember to have seen a few years ago a newspaper statement that a girl about twelve years old had been seriously injured by jumping the rope nearly 200 times without stopping. It was ascertained in that case that there was rupture at the mitral valve, probably of some of its tendinous cords.

Vegetations on the Valves.—This is another of the results of inflammation. They are minute hard warts that are formed on the free surface of the aortic valve just below its thickened margin. These are chiefly important as being the occasion of the deposit of masses of the fibrin of the blood upon the valves, so producing large granular-looking warts, which obstruct the outflow from the ventricle. Any roughening of a valve-surface by inflammatory or other disease, or by rupture, may cause the deposit of these *fibrinous concretions*. When they occur they not only obstruct the flow of the blood, and partially disable the valves, but portions of them may be washed off into the arterial current, and be carried into a distant organ, as the brain, spleen, or kidney; and one of these reaching an artery too small to receive it, it stops there, and cuts off the arterial blood from all portions of the organ usually supplied

by the obstructed vessel. This mode of plugging up the arteries is called *embolism*; the plug itself is an *embolus*.

In the advanced stages of these diseases of the valves and muscular structure it is not difficult to arrive at the opinion that there is heart disease. Shortness of breath, induced by exercise, the strong heart-beating, beating of the vessels in the neck, and, when the kidneys become diseased, the dropsies, the distress produced by lying down, tell the truth but too certainly. But they do not designate the particular form or forms of disease. This can only be learned by listening to the sounds produced by the action of the heart, and by actual measurement by percussion. Thus, in addition to the two natural sounds remaining, from one to four new ones may be produced, called *murmurs*. If there is a murmur heard most distinctly under the breast-bone, where the third ribs are joined to it, and while the ventricle is contracting (in systole), it is probable that there is obstructive valvular disease, either in the aorta or pulmonary artery, and the chances are thirty to one that it is in the former, for in this proportion at least is valvular disease found more frequently on the left than on the right side. Indeed, the grave valvular diseases of the right heart are almost always found to have occurred before birth. The aortic-valve murmurs are heard distinctly at the junction of the third costal cartilage of the left side with the breast-bone, as is also the pulmonary murmur, which is rare. If there is a murmur with and after the second, heard most distinctly at the same place, it indicates insufficiency—that is, regurgitation, as already explained. It will be remembered that the two hearts contract simultaneously, and that the two second sounds are simultaneous. If, then, the second sound on one side is silenced by deformity of the valve, the valve on the other side is, in all probability, normal, and produces its own normal second sound strongly enough to be heard. A murmur heard most distinctly in the left and lower part of the heart-region (towards the apex) is referred to a diseased mitral valve. If it is in systole, the valve is insufficient, and there is regurgitation from the left ventricle into the left auricle. If it is in "the period of repose"—that is, the period between the second natural sound of the heart and the recurring first—it will indicate an obstruction, from stiffness or other diseased change in the valve, to the flow from auricle to ventricle, for it is in this period that the auricle is emptying itself into the ventricle. There is nothing in the tone or other characters of these mur-

murs which indicates the character of the valve-change, except that a musical murmur is sometimes produced by the string left when the thicker border of an aortic cup is split off from the membrane below it, or a similar eord may be formed by rupture of the mitral valve. This must be learned, if it can be learned at all, from the general history and symptoms of each particular case.

With two exceptions, these murmurs are positive indications of change in the form, thickness, dimensions, or structure of these valves. There may be an *anemic murmur* with the ventricular contraction at the aortic opening when the blood is thin, or does not contain its normal quantity of animalized elements—or, in other words, when it contains too much water (*hydrocemia* and *chlorosis*)—and there may be actual regurgitation, and the corresponding murmur at the mitral valve, caused by the irregular or imperfect contraction of fleshy columns of the left ventricle. The same rules are applicable to valvular diseases of the right heart, except that the murmurs of the tricuspid valve are heard at the junction of the sternum and fourth right rib, and those of the pulmonary artery at the junction of the left third rib with the same bone.

These are the common forms of heart disease; and there will be in this article no better place than here to say that the popular opinion of their fatality is erroneous. Few persons can hear the announcement that they have disease of the heart, of whatever kind, without hearing in it the command, "Set thine house in order, for thou shalt surely die," and the general expectation is that the death will be sudden. It is true that there are sudden deaths from heart disease even in persons who have not been ill enough to consult a physician. But these sudden deaths are exceptions. For one such, a quarter of a hundred live on until death comes through some disease which could not have been looked for, or the kidneys become involved in secondary Bright's disease, and perhaps become the chief actor in the concluding scene. The writer discovered in a young lady thirty-four years ago mitral regurgitation and decided hypertrophy of the heart. Now she is the mother of seven children, and, as far as her friends can judge, is in perfect health, except that she has shortness of breath at times. He examined a gentleman sixty-five years of age who had obstructive aortic disease and hypertrophy, in whom he traced the origin of the affection back to an attack of rheumatism when the patient was fifteen years old; yet this gentleman had had the energy to amass for himself a fortune of a million

of dollars, and to build up the fortunes of two brothers; and that too in the good old times of honest industry. He knows physicians who carry considerable heart disease for indefinite years through an active practice. He knew one, an old gentleman, who had the disease nearly all his life, and continued his professional work till within a few days of his death. His heart weighed after death two pounds three ounces and two drams. The former possessor of the heart which weighed 57 ounces, referred to in this article, became diseased when he was six years old, and he died at twenty-eight, having been active as foreman in a large cotton-mill till four weeks before his death; and even then death was caused more by the kidneys than by the heart. These are not rare instances, but represent the important fact that these diseases, even when extreme, do not generally cause death without aid from another important organ; and when moderate in degree, if the avoidable causes of their increase are avoided, have, till the age of sixty and upward, but little influence in shortening life, except, again, with the concurrence of other and dangerous diseases.

Pericarditis.—As the lining membrane of the cavities is subject to inflammation, so is the external covering. This and the lining of the fibrous pericardium are alike liable. They are indeed but one membrane. Pericarditis and endocarditis often occur at the same time, being both produced by an extension or migration of articular rheumatism, or rather by that same state of the system which causes the articular disease. Either of these diseases may accompany Bright's disease. Beyond the concurrence with these affections the causes of pericarditis are not well defined. The disease itself, as well as endocarditis, has only been intelligently observed during the present century. The changes produced by pericarditis are, first, an increase in the quantity of blood in the vessels of the membrane; second, absorption of the fluid which in health diminishes the friction between the heart and pericardium; third, the discharge from the engorged blood-vessels of the fluid portion of the blood (*liquor sanguinis*) in condition to form new tissue, *false membrane*, or of the more watery parts, known as *serum*. Both of these products of this inflammation are commonly found, but the serum is usually much the most abundant and the most oppressive. When there is little serous fluid the disease may run its course with but little general disturbance; but when the quantity is large there is a rapid pulse, oppressed breathing, and a tendency to faint when sitting or standing. The pericardium is distended by

its watery contents, sometimes even to tension; then the normal dilatation of the heart-cavities becomes difficult. But this fluid is absorbed usually in about a week, and the pericardium comes back to its contact with the heart. The common opinion regarding the fibrinous coating produced by inflammation is that it receives blood-vessels, and remains for a time the medium of the union which almost always takes place between the pericardium and the heart, after pericarditis; but according to some late German teachings it readily breaks up into granular and fatty matter, and is carried away by absorption; and they account for the adhesion by stating that the serous membrane is roughened during the inflammatory process by the production on its surface of many little granules or warts composed of fibrin, and that these mutually grow into the opposite surface, and so cause a blending. There is produced by the dry condition of the membrane, caused by the first engorgement of the vessels, a distinct creaking or rubbing noise as the heart moves in the pericardium—a “to-and-fro” sound, in time with the pulse. This sound is renewed when the fibrinous exudation takes place, heard first in systole, and soon after in both contraction and expansion of the heart. This may be interrupted when the serous effusion lifts the pericardium off from the heart, to be renewed again when the serum is absorbed and contact is renewed. The adhesion above spoken of takes place soon after the renewal of contact, so that in this recurrence the friction-sound does not commonly continue for more than a day. When the area of dulness on percussion is rapidly extended to the left of the heart and above the third rib, and this extension follows the friction-sound, it is produced by the serous effusion. The heart-sounds under these circumstances become a little less distinct as the heart is buried in water. This is the condition indicated by the phrase “water on the heart,” popularly supposed to be a common malady, but it is not found to exist in one in twenty of the cases in which it is suspected. Pus is not often found in the pericardium after inflammation. In *chronic pericarditis*, implying chronic distension of the heart-sac, the fluid causing the distension is partly pus (sero-purulent). Chronic pericarditis is a grave disease; it is almost always fatal. In it the pericardium, in one case treated by the writer, was found to contain a gallon of sero-purulent fluid. Acute pericarditis is rarely fatal in the first attack. But in young persons subject to recurring rheumatism each return is more and more dangerous; even the third is not unfrequently fatal.

Pneumo-pericardium (air or gaseous matter in the pericardium).—A man amid the horrors of delirium tremens had a plate on which two teeth were set detached from his mouth, and he tried to swallow it, but it was stopped in the œsophagus (gullet) at a point just behind the heart. A projecting angle of the plate pierced the walls of the œsophagus and pericardium, and opened a passage by which the food and drink passed directly into the latter. Air also entered the pericardial sac. With each contraction of the heart there was a splashing noise, such as is produced by the agitation of a bottle containing air and water. Cancerous disease sometimes produces a similar opening. Gaseous matter of some sort—perhaps carbonic acid gas—is in rare instances liberated in this sac, and, so far as is known to the writer, there is always fluid in the cavity at the same time. The splashing in contraction of the heart is heard even a few inches from the body. The signs of this kind of pneumo-pericardium pass away as the signs of the pericarditis which it accompanies disappear. The perforation of the pericardium with admission of air is almost always fatal, while the elimination of gas in the cavity is not generally attended with serious consequences.

Carditis, or *myocarditis*, is an inflammation of the muscular structure of the heart. It is an occasional attendant of endocarditis or pericarditis, or may occur independently. The symptoms are vague and uncertain, so that it is difficult, and often impossible, to recognize it during life. It is, then, chiefly known by certain conditions found after death. In limited portions of the left ventricle, or in the septum of the ventricles, the muscular fibres are broken up into fatty matter and fine granules, forming what is commonly called an abscess; indeed, real abscesses are seen when the cause of the carditis is septicæmia (poisoning of the blood by decomposing animal matter), as in gangrene of the lungs. But what is more frequently met with is a cicatrix, one or more, showing that while the muscular element is broken down, its fibrous covering (perimysium) has increased in quantity, and forms a depressed cicatrix, the pyoid matter having been absorbed and carried away. These cicatrices do not always restore the strength of the structure they replace. Hence, they sometimes yield gradually, producing aneurism of the heart. Such is the current view of myocarditis, but the writer gravely doubts whether this kind of *fatty degeneration* of the cardiac muscle is the result of full inflammatory action.

The muscular fibres of the heart sometimes undergo a *fatty degeneration*, in which, with-

out change of size or change in the valves, little globules of oil have replaced the muscular substance. This degeneration weakens the heart, and causes it to act irregularly, changes its color from dark red to yellow, and materially diminishes its firmness. The disease is named, after the English surgeon who first described it, *Quain's degeneration*, or, better, *Quain's disease*. The same gentleman has recently announced that there is an hypertrophy of the heart, which is caused by an increase of the fibrous structures of the organ, while the muscular elements remain unchanged. The admission of the existence of such a disease awaits further investigation. Should the observation be verified, we shall have to admit into medical nomenclature *Quain's hypertrophy*.

Fatty heart has long had a significance very different from that of "Quain's disease." There is always on the outer surface of the heart a limited amount of what is called *adipose tissue*, or, in common language, "fat." This tissue is composed of layers of cells almost large enough to be seen by the unassisted eye, each having one or more capillary blood-vessels passing over and nearly around it. These cells contain oil, the quantity of which is large when a person is said to be "fat," or they are empty and small when he is pronounced to be "lean." This tissue is found under the skin in many parts of the body, but not in all, and in considerable quantity in the abdominal cavity. The portion of it that naturally belongs to the heart is small, and lies outside the muscular structure, and within its external serous investment (*serous pericardium*). The quantity of this is sometimes dangerously increased. It increases always at the expense of the muscle of the organ, so that the muscular wall becomes thin at certain places; and as the adipose tissue has not the strength of muscular, which it has displaced, the heart-wall is weakened where it is most increased. The undiminished strength of the other portions of the wall of the same cavity will sometimes cause this weaker part to give way.

Rupture of the heart occurs in the manner just described. It may occur also when the wall of either ventricle is weakened in one part only or principally. This may be the effect of a local development of Quain's disease; of an ulcer caused by the deposit of atheromatous matter on the outer surface, and its subsequent softening; of abscess and pseudo-abscess resulting from myocarditis, as above described; or from *aneurism* of the heart, in which an external tumor is formed by the internal pressure of the blood and the gradual yielding of a limited portion of the wall. There is then really a *broken heart*. When this rupture occurs, the blood pours

through it, and soon fills the pericardial sac, and the heart-dilations are prevented. Such a sudden death is preceded by few symptoms, and sometimes by none. This occurrence is, however, rare. When it results from adipose degeneration, it is commonly found in the right ventricle; when from other causes of local weakness, it is usually found in the left.

Heart-Clot.—In rare instances the blood coagulates in the heart before death. This coagulation may be the cause of death, or the subject of it may survive for years. It may occur in the left ventricle, where it may be an inch or more in diameter, but being attached to the raised cross-muscles of this cavity, it does not obstruct the passage of the blood into the aorta. The fibrin which constitutes this mass is arranged in layers, and in most of the few instances that have been seen the central portion had already broken down into a yellowish fluid, which has been erroneously taken for pus. Clots and fibrinous aggregations, formed in the heart-cavities during life, may be the cause of death, either suddenly or remotely. The clots found after death usually fill one or more of the cavities, and are attached to the cavity-wall *in all its circuit*, or they are divided into two parts—one yellow or yellowish-white, glistening, and not wholly opaque; the other very dark, almost black. In hundreds of instances such coagulations as these have been regarded as ante-mortem clots, and the immediate cause of death. If a clot is formed before death, the heart must contract upon it at least once. One such contraction is sure to separate it from its adhesion through a considerable portion of its circumference. The production of the light-yellow clot is only possible when the blood has been at rest long enough to allow its red corpuscles to sink in the fluid as far as this buffy portion extends; and the reason for its forming so considerable a portion of the whole coagulum is that the blood does not usually coagulate in the body till about six hours after death.

Embolism and Thrombosis of the Coronary Arteries of the Heart.—The first of these terms refers to the fact that clot or fibrinous concretion may form in the heart, as already explained, and that a part or the whole of it may be detached and carried forward till it reaches an arterial division too small to receive it; it cannot go back, but must remain there, preventing the circulation of arterial blood in the artery beyond it, till it is disintegrated and carried away. It is possible that a portion of a fibrinous concretion on the valves or wall of the left ventricle, so detached, may enter one of the coronary arteries, and so obstruct it. But a section of the aortic valve covers the mouth

of each of these vessels during the contraction of the ventricle, and they receive their blood in the reflux, after the closure of the valve; and the force that propels it is the elasticity of the aorta. This protected condition must render such an accident very rare. What we are more familiar with is *thrombosis*, or the coagulation of blood in the artery. This cuts off half of the supply of blood to the heart; a pretty rapidly increasing feebleness of the heart-action follows, with a weak and slow pulse, great prostration of strength, extreme paleness of countenance, coldness of the feet and hands, and after these symptoms death occurs in ten to twenty hours in the majority of the cases.

Angina pectoris (breast-pang). See ANGINA PECTORIS.

Deformities and Defects.—The growth of the heart may be arrested in any of the stages of fetal life. The most common of these defects is an open foramen ovale, permitting venous blood from the right auricle to mingle with the arterial in the left. This is produced when the current through the pulmonary artery is obstructed. This state of the heart is known as *morbus cœruleus*, or blue disease. The name, however, applies equally to other congenital defects that permit venous blood to pass into the left heart or into the aorta to circulate in the arteries, producing blueness of the skin. This color is not constant, except in a few, but is produced by crying, a fit of coughing, excitement, or unusual physical exertion. It is not incompatible with a life of limited duration, but is likely to be attended by diminished growth of body, bodily and mental sluggishness, shortness of breath, palpitation at times, and occasional fainting. If the subject of any of these defects survive the first years of life, the defect alone will not probably be the immediate cause of death, but it will diminish the power of resisting a fever, a pneumonia, or any grave disease, and especially one that disturbs the balance of the two circulations.

Less than $\frac{1}{25}$ (4 per cent.) of all deaths are caused by all these agencies put together; a very large proportion of the deaths so occurring are in persons of advanced age; even when disease fastens on the heart, it does not, as a rule, preclude the hope and expectation of "length of days;" and counting, from youth to age, not one in a hundred persons has any kind of disease or defect of the heart. (See also articles ANÆMIA, PALPITATION.)

Hec'tic Fever [Gr. *ἐκτικός*, from *ἔξω*, "habit"], a fever which is so continued as to constitute a *habit* (*ἔξω*) of the body. Such fevers are probably always symptom-

atic of some local or extended irritation. Thus, hectic attends pulmonary consumption, chronic pleurisy with extensive exudations, peripheral caries of the bones, etc. Hectic, as it occurs in pulmonary consumption, is sometimes intermittent, with evening exacerbations; sometimes almost constant. The latter kind generally affords a bad augury, and it cannot in general be much relieved by treatment; but intermittent hectic may often be palliated, greatly to the patient's relief. Remedies are therefore directed against the primary disease.

Hemiplegia [from the Gr. *ἡμι-*, "half," and *πλῆγη*, a "stroke"], that kind of paralysis which affects only one side of the body; or if both sides are affected, it is from the occurrence, a very rare one, of double hemiplegia—that is, of two concurrent paralytic strokes, one affecting each side. It manifests itself usually in the upper and lower extremities of one side, and in the parts of the head which are supplied by the fifth nerve. It may be the result of an apoplectic stroke, or of a slow effusion, or of the growth of a tumor within the brain. Owing to the decussation of the pyramids, the paralysis takes place usually on the side of the body opposite to the side of the brain in which the lesion has occurred. For example, if there be a tumor growing in the left hemisphere of the brain, the paralysis will, as a rule, be manifested in the right side of the body, because the nerve-fibres cross over from side to side near the base of the brain. But if the lesion occur below this crossing, there may be hemiplegia on the same side. Hemiplegia affects chiefly the nerves of motion, but affects more or less those of sensation also. Temporary attacks of hemiplegia are also observed in chorea, epilepsy, and hysteria. The treatment of hemiplegia varies with the condition of the patient and the cause of the stroke. Generally, time and rest are important to the relief of the patient.

Hepati'tis [Gr. *ἥπαρ*, the "liver"], an inflammation of the liver. Hepatitis is not a very common disease in any country. Several kinds are recognized: (1) Suppurative hepatitis, or abscess of the liver, sometimes occurring in India, but rare in other countries. (2) Interstitial hepatitis, called, rather incorrectly, cirrhosis, known also as granular liver and gin-drinker's liver. It is incurable, and is probably always caused by the improper use of alcoholic drinks. It frequently leads to ascites or abdominal dropsy. (3) Portal phlebitis, or inflammation of the portal vein, may occur. (4) Inflammatory disease of the liver is sometimes a syphilitic complication. Each of the above-named conditions is a grave one,

and in few cases can treatment be of much avail.

Hernia [Lat.], the protrusion of a viscus from the cavity to which it normally belongs; but the term is generally used to express the protrusion of an abdominal viscus, as when we speak of other forms of hernia we express it thus: *hernia cerebri*, *hernia corneæ*, etc. The predisposing cause of hernia is a weakness of some portion of the abdominal walls, and there are certain parts which are naturally weaker than others, as the inguinal, umbilical, and femoral regions. This weakness very often exists congenitally, and may be increased or produced by injury, disease, or pregnancy. Among the exciting causes may be mentioned violent muscular exertion, jumping, straining from lifting heavy weights or at stool, playing on wind instruments, etc. The usual contents of a hernial sac is a portion of the small intestine or the omentum, but we may find portions of any of the viscera in it, especially when the abdominal walls are congenitally weak. The sac is formed of peritoneum, which is covered by the integument and subjacent fasciæ.

Hernia is generally divided in two ways: 1st, according to its situation, as inguinal, femoral, umbilical, diaphragmatic; 2d, according to the condition of the protruded viscus, as reducible, irreducible, and strangulated. Reducible hernia is that variety in which the contents of the sac may be returned into its normal cavity without recourse to a surgical operation. It sometimes disappears spontaneously when the patient seeks the recumbent position, but more often needs a greater or less amount of pressure to be made in the proper direction. The reduction is facilitated by raising the foot of the bed in which the patient reclines, and by the inhalation of ether or chloroform. The symptoms of it are—the appearance of a soft and compressible swelling at some portion of the abdominal wall, which increases when the patient stands up and diminishes when he lies down; by placing the hand upon the tumor and directing the patient to cough a distinct impulse is imparted. The treatment usually adopted consists of the reduction of the contents, and the application of a suitable truss to prevent the re-protrusion. If the patient is young, this method will effect a radical cure in time, but in the adult recourse must be had to an operation to effect this.

Irreducible hernia differs from reducible in that the protruded viscus cannot be returned into its normal cavity. The general causes of it are adhesions between the sac and its contents, the growth of membranous bands across the sac, or enlargement of the

contents. It is much more troublesome than the preceding variety; in the first place, it is much more inconvenient, and is always exposed to the danger of strangulation; the patient suffers from indigestion, constipation, colic, flatulence, and dragging pains in the loins. The treatment of this variety must be generally palliative, and consists of the patient's avoidance of all violent exercise; regulation of the bowels, which should never be allowed to become confined; and the wearing of a truss to support and protect the tumor.

"Hernia is said to be strangulated when it is constricted in such a way that the contents of the protruded bowel cannot be propelled onward, and the return of its venous blood is impeded." There is always more or less inflammation, caused by the constriction. The causes of this condition are sudden enlargement of the contents of the sac by feces or gas, or congestion or swelling of the neck of the sac. The symptoms are—pain, flatulence, a desire to go to stool, constipation, nausea, and vomiting, the vomited matter after a time becoming stercoreous. The tumor is hard, and cannot be replaced in the abdominal cavity, and there is very little impulse transmitted to the hand when the patient coughs. The pain in the tumor continues to increase, and extends over the whole of the abdomen; the countenance assumes an anxious expression; the pulse becomes small and wiry, and the skin cold and clammy. Should the pain cease, and the tumor feel doughy and crepitate when handled, we may be sure that the intestine has mortified; when this happens there is very little hope for the patient; in fact, the only chance for recovery now is by an artificial anus. The object of treatment is to return the intestine into its cavity. When this cannot be accomplished by manipulation, or manipulation combined with warm baths and the administration of ether—the patient having first been placed in such a position that all the parts in the neighborhood of the trouble shall be completely relaxed—recourse must immediately be had to an operation. This consists in enlarging the constricted portion, so as to allow of the return of the gut. It is done by cutting down to the sac, and either opening it and dividing the stricture, or dividing the stricture without opening the sac, or by merely incising the neck of the sac.

Herpes [from the Gr. *ἑρπω*, to "creep"], a name applied to several skin diseases, characterized by the development of a series of vesicles or clusters of vesicles, which generally run a definite, self-limited course. By far the most important of these diseases is *Her-*

pes zoster, zona, or "shingles," as it is called. This may surround one thigh or one arm with a band of vesicles, or more frequently it starts from the backbone and follows an intercostal space half round the body. More rarely it goes half round the neck or half across the face. There is usually some neuralgic pain, and sometimes considerable fever. The disease must depend upon some abnormality in the nervous action, as it frequently maps out upon the surface the part of the integument supplied by some one branch of a nerve. The vulgar have a great dread of "the shingles," and believe that when it so extends as to completely girdle the patient he will die. But, in the first place, it almost never does go more than half way around the body, and, what is more, there would be no danger if it should, for the disease is a self-limited or eyelical one, and the patient is sure to get well if let alone. Other forms of so-called herpes, such as *H. circinatus*, are caused by parasitic vegetation, and should be treated with applications of sulphurous acid and water or other parasiticide agents.

Hic'cough, or Hic'cup [Lat. *singultus*], a elonic spasm of the diaphragm and of the glottis accompanied by a sharp sound, produced by the rush of air into the larynx from without. It may attend an over-distension of the stomach with food, and sometimes accompanies intoxication. In young children it often is the forerunner of intestinal disturbances. When persistent, it is, in some diseases, such as low fevers, peritonitis, and gangrene, a rather grave symptom. Lumps of ice frequently swallowed or small doses of antispasmodic medicines will usually relieve obstinate hiccough.

Hip-joint, Diseases of. See COXALGIA.

Hives. See NETTLE RASH.

Hoop'ing Cough. See WHOOPING COUGH.

House'maid's Knee (so called because it is said, though with little reason, to be most common among housemaids, who scrub stairs and floors upon their knees), an acute or chronic dropsical effusion into the bursa before the knee-pan. It is easily diagnosed, and does not communicate with the knee-joint proper. Acute cases may be cured by rest and the application of iodine, mercurials, and tight bandages; chronic ones, by compression with suitable splints, or even by evacuation and injection of iodine solution into the sac.

Hydat'id, a morbid growth characterized by the development of a cyst, which contains an aqueous and transparent fluid, in which floats a parasitic worm, generally the accephalocyst. The term was formerly used to designate any encysted tumor containing a transparent liquid, but is now restricted to that

form which encloses a parasite. The organs most commonly affected by this peculiar disease are the uterus, ovaries, and liver; next frequently we find it in the breast and testicles, but rarely in other parts of the body. It generally appears as a round hard tumor, which occasions more or less pain and inconvenience; this tumor is made up of hydatids, although we sometimes have it occurring singly, when it will be proportionately large. Each parasite consists of a body and head; around the latter we find a row of teeth which are hook-like and sharp. The body is solid, and displays a number of ovoid bodies beneath its coat, which give it a speckled appearance. As the tumor increases in size, if it is near the surface, we can feel fluctuation; the pressure under the skin causes it to ulcerate, and the hydatids may thus perish. If they are situated in some internal organ, they may produce very serious complications, as peritonitis, osteitis, etc. The treatment consists in excision if they are sufficiently superficial, otherwise we can do nothing.

Hy'drocele [Lat. *hydrocele*; Gr. *ὕδωρ*, "water," and *κύλην*, "tumor"], an accumulation of water between the two serous coverings of the testicles or of the spermatic cord, known as the tunica vaginalis. It may follow an inflammation of the testes, but generally follows strains. It may affect both sides at the same time, but usually we find the effusion on one side only. It forms a pear-shaped, painless tumor, which causes uneasiness to the patient only on account of its size; it sometimes grows so large as to reach nearly down to the knees. Unless the sac in which the fluid is enclosed be abnormally thick and distended to its utmost by the contained fluid, fluctuation can be felt. There is no impulse felt upon coughing. By stretching the integuments over the tumor, and placing a candle behind it in a dark room, the light will be transmitted; this would not occur if the swelling were solid. Another test to determine the consistence of it is to plunge a needle into the mass, and see whether it falls over to one side and floats about, or retains the position in which it was placed. The treatment of hydrocele may be divided into the palliative and the radical. The former consists in drawing off the effused fluid by the trocar and canula; this relieves the patient for a longer or shorter time, but the sac is apt to fill again, when the operation has to be repeated. We find patients submitting to this operation from once to four times annually throughout their lives, rather than submit to a procedure which is perfectly harmless and would ensure their complete recovery. The radical cure is effected by

exciting an inflammation in the sac which shall cause the opposing surfaces to adhere, and thus obliterate the cavity and prevent further effusion. This is sometimes accomplished by irritating the surfaces with the end of the canula before it is withdrawn, but this method is uncertain. Generally, it is done by injecting some stimulating fluid; for this it was customary to use port wine or zinc lotion, but more recently tincture of iodine seems to be the favorite. If there is much inflammation, cold applications locally and opium internally are the indications.

Hydroceph'alus [Gr. *ὕδρον*, "water," and *κεφαλή*, "head"], a drop-sical effusion of fluids into the interior of the skull, occupying one or more of the ventricles of the brain or the sub-meningeal space, or both. Acute hydrocephalus is ordinarily a symptom of MENINGITIS (which see), particularly of tubercular meningitis; but cases occur in which no tubercle can be discovered after death. The causes of chronic hydrocephalus are various. It is regarded as certain that arrest of development of the brain-substance, pressure upon the veins of Galen by masses of tubercle or cancer, and in fact any condition which obstructs the venous circulation in the brain, may lead to hydrocephalic effusion. The large majority of cases are congenital, and hydrocephalus must be set down as a disease (or symptom) belonging to infantile life; but cases occasionally occur in mature life or in old age. Dean Swift, after three years of illness, died with hydrocephalus, the result, doubtless, of organic brain-disease. The prognosis of chronic hydrocephalus is very grave. The child may live for many years, but (with rare exceptions) becomes idiotic, and in some cases is epileptic. The head becomes distended, the fontanels remain open, *ossa triquetra* form in the courses of the cranial sutures, and in some cases quarts of fluid are effused, consisting of water, with earthy salts and a little albumen; while in acute hydrocephalus there is sometimes much albumen present, with some pus-corpuscles or a little blood. When the disease is detected early, mercurial inunctions, with the administration of the iodides, may possibly afford benefit. Treatment by systematic compression or by tapping the skull (the latter operation to be followed by firm compression) has been tried in many cases, but the most common result has been the speedy death of the patient, although in a few instances it would appear that more or less advantage has been obtained by these means. The term *spurious hydrocephalus* is sometimes applied to infantile typhoid or other enteric disease, the general symptoms of which may simulate those of acute meningitis.

Hydropho'bia (syns. *Rabies*, *Rabies canina*, *Rabies contagiosa*), [from the Greek *ὕδωρ*, "water," and *φόβος*, "fear"] is a remarkable disease to which both the human species and probably all of the brute creation are subject. We can discover only rare allusions to it previous to the Christian era. Such references, however, are sufficient to indicate that, although it may not have been so prevalent among the nations of antiquity as among those of more modern periods, yet it was in very ancient times recognized as a peculiar disorder infesting certain animals, and even man himself. There are two passages in Hippocrates which appear to indicate that he had observed its characteristic symptoms in man, but failed to regard it otherwise than as a variety of idiopathic phrenitis. His contemporary, Democritus, however, who was a famous traveller, had probably encountered the disease in foreign regions, as he was evidently well acquainted with its most striking peculiarities. We are informed by the distinguished physician Cælius Aurelianus that Democritus, in a treatise upon opisthotonos, had described the affection in the human subject, admitting its origin from the bite of rabid animals, but considering it simply as a form of tetanus. Theocritus and Plato refer to madness among wolves. Aristotle, in his *History of Animals*, remarks that dogs are afflicted with madness, quinsy, and gout; that the first renders them furious and inclined to bite other animals, which thereupon also become rabid; and that all animals except man are liable to be seized with and destroyed by the malady so engendered.

In the early portion of the Christian era the allusions to this affection become more frequent. Virgil, in his *Georgics*, classes rabies among the distempers of cattle and sheep induced by a pestilential condition of the atmosphere. Ovid speaks of a rabid she-wolf and rabid centaurs (*rabidi Bimembres*), and Pliny of the bite of a mad dog. Horace employs the expression *rabies canis*. The disease is mentioned by Columella, a writer on husbandry in the first century, who alludes to an opinion common among shepherds that a dog may be ensured against rabies by biting off the last bone of its tail on the fortieth day after birth. This is still a popular superstition. Suetonius refers to wild animals affected with madness (*fera rabida*). Dioscorides, in the time of Nero, appears to be the first who claims to have actually observed and treated the disease. Both he and Galen describe it as attacking animals and men, and agree in the opinion of its communicability from the former to the latter by contact of morbid

saliva with the second skin. But Galen, and Celsus as well, concern themselves rather with the prevention and treatment of hydrophobia than with its history and progress. According to Plutarch, it was not until the time of Pompey the Great that the rabific poison first began to manifest itself among human beings. Cœlius Aurelianus is the first to furnish an accurate detailed description of the affection in man, and of the various controversies regarding it. He called it *passio hydrophobica*. Ætius, a Mesopotamian doctor of the sixth century, is the first to furnish anything like an accurate description of rabies in dogs. A century later the physician Paulus Ægineta gives an excellent account of hydrophobia, dividing it into two varieties—viz. that arising from inoculation, always fatal, and that due to nervous irritability, capable of cure. A similar distinction is now sometimes made, particularly by French authors. Rhazes affirms that a certain hydrophobic man barked by night like a dog and died, and that another when he beheld water was seized with trembling, extreme terror, and rigors. Avicenna, at the commencement of the eleventh century, describes hydrophobia with considerable fullness, noticing several of its phenomena ignored by the Greek and Roman authors. He terms it simply *canis rabidi morsus*. In 1026 an outbreak of rabies among dogs is mentioned in the laws of Howel the Good. From that time it appears to have been well known in England, numerous specific remedies, charms, and incantations against it being recommended in old Anglo-Saxon manuscripts still extant. On the continent of Europe the modern history of rabies is obscure until the thirteenth century. One of the earliest reports of scientific interest refers to wolves afflicted with the disease in Franconia, Germany, in 1271, where more than thirty shepherds and peasants fell victims to their attacks. Since that period we find frequent mention of the affection as prevailing in an epizootic form in almost every country of Europe, but more particularly in the wooded districts of Germany, Switzerland, and France, appearing to attack principally wolves, dogs, and foxes. Vulpine madness, however, was not noticed until the beginning of the present century in Europe, although it had appeared in the neighborhood of Boston, U. S., in 1768. In 1776 rabies made its first appearance in the French West Indies, and in 1785 it became extremely prevalent throughout the U. S., and since that time the disease in both animals and men has occupied a prominent place in our medical literature. In Asia its history, as we have seen, is very ancient.

It has never appeared in Australia or New Zealand.

The popular belief that hydrophobia is in all animals characterized by an *abhorrence of water* was long since proved to be erroneous. The mad dog laps it eagerly, and will not hesitate to swim in it when it obstructs his course. In the case of man, however, the attempt to drink, or whatever is suggestive in any manner of that act, induces such dreadful spasms of the muscles of deglutition and respiration, with sense of suffocation, that a horror of fluids, even though associated with intolerable thirst, may be truly regarded as one of the most prominent and characteristic features of the disease. For these reasons a distinct term, *rabies*, has been employed by some writers to designate this affection as it prevails among the brute creation, the word *hydrophobia* being restricted to the disorder as manifested in man.

It is almost universally conceded that *the introduction of a specific virus, from a rabid animal, into the system, through either an actual wound, an abraded surface, or a delicate mucous membrane, is an essential preliminary to the development of this affection in man.* But its origin among brutes has always been, and still is, a subject of much discussion. Hydrophobia certainly infests, and by many is regarded as originating *de novo* among, certain Carnivora—viz. the dog, wolf, jackal, cat, skunk, and raccoon—while herbivorous and other creatures, including man, contract it by inoculation alone. Of the various conditions asserted as favoring its spontaneous development in the canine race, few have even a probable foundation. They are principally repressed sexual desire, extremes of atmospheric temperature, excitement of anger, want of water, and putrid or insufficient food. Still another presumed influence is the presence under the dog's tongue of a worm-like appendage, whose extirpation in puppyhood is considered an infallible preventive of the disease. This idea may doubtless be referred to a very ancient myth. Pliny speaks of it, terming the peculiar appendage *lyssa*. The Germans term it *Tollwurm*, or worm of madness, and among them it has long been a popular superstition. The practice of removing this so-called worm still exists in Thrace, Turkey, Greece, Roumania, Moldo-Wallachia, Spain, and even in the Southern U. S. Its efficacy has been entirely disproved by scientific investigation, and the operation may be best characterized, in the expressive language of Dr. Johnson, as "a substance—nobody knows what, extracted—nobody knows why." The other presumed causes of spontaneous hydrophobia would appear

to be equally equivocal. Unsatisfied salacity, putrid food, hunger, thirst, anger, and extremes of temperature are manifestly circumstances which obtain among dogs quite generally throughout the world. But in some regions abounding in dogs hydrophobia has always, so far as can be learned, been either totally unknown or extremely rare, while in others exempt from it for ages it has only recently appeared, and in most instances can be traced positively to importation. Such exemption has been particularly noticed in various islands throughout the world and in isolated localities. It is related that Mr. Meynell, the most eminent English sportsman of the last century, preserved his kennel of hounds from hydrophobia during many years by forcing every new dog to undergo a rigid quarantine of several months preparatory to his admission into the pack.

Rabies canina prevails indifferently in all seasons. It seems quite well established that all creatures liable to contract the disease are also in a greater or less degree competent to transmit it, and we know of no animals exempt from it. It is true that herbivorous and ruminating beasts, owing to the formation of their jaws and teeth, as well as to their seldom attempting to bite when rabid (sheep only excepted), rarely communicate the disease; and hence the belief, entertained for some time by such eminent men as Sir Astley Cooper and the veterinary professors Coleman and Renault, that the power to propagate the affection was confined to such animals as naturally employ their teeth for weapons of offence. The fallacy of this opinion has been proved by numerous unquestionable experiments, and it is now likewise conceded by the best authorities that the saliva of a hydrophobic human being is capable of inoculating the disease.

The dog affords us the most frequent opportunities for observing the phenomena of this redoubtable affection. Hydrophobia in the dog has been by some writers divided into two varieties, *dumb* and *furious* rabies, according as the animal is silent and undemonstrative or noisy and fierce. Other authors recognize still a third variety, which they term *tranquil* rabies, where the animal is quiet, indifferent, and unaggressive. Virchow considers the different forms merely as prolonged conditions or stages, which, according to him, are—1st, the stage of *melancholy*; 2d, the *irritable* and *furious*; 3d, the *paralytic* stage. The disposition to bite is not apt to be exhibited until the affection is well established. The disease is first manifested by constant restlessness, uncasiness, and irritability of temper, the dog

of fondling or sociable disposition becoming snarly, morose, and shy, retiring under pieces of furniture, into dark corners, or the interior of its kennel, but not remaining long in any one spot, and being continually engaged in licking, scratching, or rubbing some portion of its body. Costiveness and vomiting are often present. The appetite becomes depraved. The countenance undergoes a marked change—assumes an appealing expression or becomes the very picture of ferocity. In the early stages the animal's attachment for its master appears greatly exaggerated, and as long as it retains its consciousness it will refrain from injuring him. Two early and characteristic signs of rabies are a peculiar delirium, causing the animal to snap at imaginary objects in the air, and a remarkable alteration in its voice, the bark ending very abruptly and singularly in a howl a fifth, sixth, or eighth higher than at the commencement. Sometimes it will utter a hoarse inward bark, rising slightly in tone at the close. Common symptoms are strabismus and twitchings of the face. In a couple of days the animal begins to lose control of its voluntary muscles and experiences difficulty in eating and drinking. In the early stages frothy spume or slaver is generally seen dripping from its jaws, but this soon lessens in quantity and becomes thick and glutinous, adhering to the corners of the mouth and fauces, and causing intense desire to drink. It is now insensible to pain—will munch burning coals or even mutilate itself without apparent suffering. It exhibits an inclination to escape from home, to which it will sometimes return after many hours of absence. It is restless and savage, wandering about, attacking imaginary objects or venting its fury upon real ones. If confined, it gives utterance to the peculiar bark and howl described. When at large, however, it gives forth no warning noise, but seems only determined upon a straightforward trot. If interfered with, and more especially if struck, it will wreak its vengeance on the offender, but will seldom, as a rule, go out of its way to do a mischief, and if pursued will generally endeavor to escape. It does not continue its progress long, but becomes exhausted, and moves with unsteady, tottering gait, drooping tail, head toward the ground, mouth open, and protruded tongue of a lead-blue color; finally, paralysis ensues, first of the hind quarters and then of the whole body, which is promptly followed by death. Its duration rarely exceeds ten days; the ordinary time is from four to six days. Nothing has been positively determined with regard to the interval elapsing

between the receipt of the injury and the appearance of rabies in the dog and other animals. It seldom, however, exceeds six months.

Hydrophobia in our own species possesses a deep and melancholy interest on account of the peculiarity of its mysterious and often prolonged latency, the horrible intensity of its paroxysms, and its irresistible fatality. The virus of the rabid animal, when once its insidious operation has begun, defies the most consummate therapeutical skill. When the rabific poison has been deposited within the body no extraordinary appearances succeed about the point of reception, which seems to heal and cicatrize entirely in a natural manner. At that spot, however, the virus remains *perdu* until at some uncertain period it comes forth stealthily upon its deadly errand. The duration of this latency is no less variable in man than in the lower animals. According to Thamhayn's statistics of 220 cases of hydrophobia in the human subject (in *Schmidt's Jahrbücher*, 1859), the period of incubation in 202 instances ranged from three days to six months. In 145, or the large majority, it extended to from four to thirteen weeks. One occurred after four years, and another after five and a half years.

One of the earliest symptoms is usually a tingling sensation at the cicatrix, which sometimes opens and discharges a thin ichorous fluid. In a short time the person grows dejected, morose, taciturn, restless, and irritable; he seeks solitude and shuns bright and sudden light. Within a period varying from a few hours to several days the more serious and characteristic symptoms are developed. The patient is sensible of a stiffness or tightness about the throat, and is troubled with some difficulty of swallowing, especially liquids. Deglutition soon becomes impossible unless attempted with the utmost resolution. The real paroxysms of the disease then supervene: they are either spontaneous or produced by anything suggestive in the slightest degree of the idea of drinking; they are preceded by chills and tremors. During these attacks sensations of stricture about the throat and chest are experienced; the respiration is painful and embarrassed, and interrupted with sighs and sobs; in fact, there occur terribly violent spasms of the muscles of the throat, almost intercepting the entrance of air into the trachea. In the intervals between the paroxysms the patient is sometimes calm and collected, retaining full consciousness and knowledge of his condition, but generally he exhibits more or less excitement and irregularity, and occasionally has fits like those of insanity. Frequently he is seized with a species of

delirium; he seems to see about him swarms of flies; he converses with imaginary persons or fancies himself in the midst of perils. When suddenly addressed, however, his hallucinations are for a time dispelled. Occasionally, in some of his fits of violence he will attempt to bite his attendants, will roar, howl, curse, and endeavor to destroy anything in his reach. He often seems conscious of the approach of such attacks, and will beg to be restrained. Hyperæsthesia of the skin and acute sensibility of the nerves distributed to the other organs of the senses are usual. A very characteristic symptom is the copious secretion of a viscid, tenacious mucus in the fauces, which the patient constantly hawks up and spits out with vehemence in every direction, producing a sound sometimes imagined to resemble a dog's bark. The tongue is at first coated and red, afterwards dry and brown. Occasionally there is vomiting of a "coffee-ground" fluid. The pulse is quick and excited, becoming very frequent and feeble before death. The urine is high-colored and scanty. It generally contains albumen, sometimes sugar. The temperature of the body is always elevated, which is coincident with rapid waste of tissue. Often within a few hours a plump and well-nourished patient grows shrunken and emaciated, and the face of youth is transformed into the shrivelled visage of old age. As the disease advances cerebral disorder becomes more and more marked. The eyes are staring, bloodshot and always open, frequently with dilated pupil; the speech is abrupt, rapid, and incoherent, and at length there is confirmed delirium. Sometimes remissions occur, and the patient eats, and even drinks, with great difficulty, however. Towards the end such a remission, with complete subsidence of agony and agitation, is not uncommon. But this relaxation is only a delusive calm, the prelude to dissolution, which is usually unattended with violent symptoms. Death ordinarily ensues from asphyxia. The duration of the disease is generally from two to five days. It has been known to terminate within twenty-four hours, four of such cases being recorded by Thamhayn, while in a case mentioned by Tardieu life was prolonged for nine days.

It is now quite generally admitted that although hydrophobia may be originally due to a blood-contamination, its action when developed is manifested exclusively through the nervous system, and principally that portion whose functions are governed by the medulla oblongata.

In man the most careful examinations of those who have perished from hydrophobia have proved inconclusive as to the pathogeny

of the disease. In some instances the cerebrum, cerebellum, medulla oblongata, spinal cord, and eighth pair of nerves, in both origin and distribution, have been found apparently normal after the closest scrutiny with the naked eye as well as skilful microscopical investigation. Congestion, effusion of lymph, and even softening, have occasionally been observed in portions of the brain, medulla, or cord, but these and all other lesions thus far discovered in the body can only be regarded as *results* of the dreadful disturbance in the nervous centres and respiratory and circulatory systems. Autenreith, Brandreth, and Sallin have seen the nerves communicating with the cicatrix inflamed. The distinctive character, however, of these disease-germs remains to be established. There is a special hysterical or *mental hydrophobia*, as Trousseau named it, induced by emotion on seeing hydrophobic patients, through fear of the disease after having been bitten, or even in very nervous people from simply hearing the description of a case. In this spurious hydrophobia there is only difficulty in swallowing, and no convulsions, scantiness of urine, or elevation of temperature. It is very rarely fatal.

When once the rabific virus has declared its presence in the human system, all measures hitherto adopted would appear unavailing to arrest its course. With our present knowledge the most satisfactory treatment after the disease has appeared consists in simply fulfilling rational indications—viz. by palliating the symptoms as far as possible, excluding all controllable causes of mental and physical disturbance, and supporting the powers of the system with stimulants and appropriate alimentation. There is no doubt, however, that we have at our command effectual *prophylactic* means for destroying the poison, provided they be employed within a reasonable time after the infliction of the injury. These precautions consist in the application of a ligature, if possible, to impede the circulation in the wound, in sucking the wound, and in its thorough cauterization, nitrate of silver being the most valuable agent; but if this be not available, the hot iron, a burning coal, potassa fusa, or almost any acid may be used.

Hyper'trophy [Gr. *ὑπέρ*, "over," and *τροφή*, "nourishment"], in pathology, the overgrowth of any part or organ, or the disproportionately large size of such an organ. Hypertrophy is simple, homœoplastic, heteroplastic, or hyperplastic, these terms defining the character of the added material which gives the increased size. It may be caused—1st, by an increased exercise of the

part, an exemplification of which we have in the blacksmith's arm; 2dly, by an increased supply of blood to a part, the part being healthy; 3dly, from some local derangement, as may be seen in exostoses, fatty tumors, etc. The treatment of hypertrophy has been very unsatisfactory; in fact, we can do next to nothing for patients suffering from the first and second varieties. The third should be removed by the knife if any inconvenience is caused.

Hypocho'ndria (pl.), [Gr. *τὰ ὑποχόνδρια*, the regions "under the cartilages"], in anatomy, the regions of the abdomen on either side of the epigastrium. The name is also given to the diseased condition of late more frequently called hypochondriasis by the medical profession.

Hypochondri'asis [so-called from the old belief that the hypochondria were the seats of the disease], a morbid state of mind, more common in men than in women, in which the patient imagines that he suffers from diseases which he does not possess, and in which he suffers from subjective sensations entirely unaccounted for by the objective signs of disease in his case. The disease itself is real. It may result from dyspepsia, from sexual excess, or from other causes interfering with the nutrition of the nerve-centres. The disease may amount to positive insanity, and is then classed as *melancholia*. Medicine and hygienic regimen often do but little good. Cheerful companionship, fishing, hunting, and boating, long journeys, even the reading of well-selected novels—in fact, anything which will divert the mind from its habit of morbid self-observation—will be found useful.

Hyste'ria [from *ἰστέρα*, the "womb"], a peculiar nervous affection which in former times was supposed to have had its seat in the womb, but at the present day Hasse's theory of its origin is generally received—viz. that it arises from a nutritive derangement of the general nervous system, both central and peripheral. This may be caused by any organ of the body being diseased, and there can be no doubt but that it is dependent most frequently upon disorders of the uterus and ovaries, simply because these affections produce a deeper impression upon the nervous system. This condition of the nervous system may also be produced by improper nourishment. There is a predisposition to the disease manifested. A tendency, either congenital or acquired, plays a much more important part in inducing this affection than all the causes enumerated.

Hysteria generally attacks women from the age of puberty to the decline of menstruation. It is of rare occurrence among men, and in them is produced in a manner

similar to that in which it is produced in the opposite sex. Hysteria may manifest itself in a great variety of ways; in fact, it simulates almost every known disease, and often with the greatest care the practitioner is unable to differentiate them. The most common form, however, is the hysterical fit. In some cases this consists merely of the twitching of the muscles of a particular region, as of the face, arm, or leg. In other cases the whole body is affected at once. The patient generally laughs and cries alternately; this is due to spasm of the group of muscles which operate in producing these acts. Another very common accompaniment of these paroxysms is the so-called *globus hystericus*; this consists in the sensation as of a ball rising from the uterus and ascending through the abdominal and thoracic cavities to the throat, and is caused by a spasmodic contraction of the œsophagus. The patient may scream, tear her hair and clothes, and beat her breasts. In severe cases we sometimes have loss of consciousness and convulsions; when this occurs it is almost impossible to distinguish it from epilepsy. The fits usually terminate with the discharge of a large quantity of almost colorless urine. Perhaps the next most common manifestation of the disease is hyperæsthesia, either general or localized, but most frequently the latter. Under this heading would come hysterical peritonitis, in which the patient will complain of great pain and tenderness over the region of the abdomen; she will jump and cry out upon the slightest touch. Accompanying this condition there will be a rapid pulse and increased temperature. The characteristic of the hysterical affection is that the pain is not aggravated upon deep pressure, and if you distract the patient's attention from her trouble you can very often knead the abdomen without the least discomfort to her. The "stitch in the side" of young girls and women can generally be ascribed to hysterical hyperæsthesia. The opposite condition, anæsthesia, may occur sometimes, to such an extent that the patient will allow your finger to be thrust into her eye or needles to be plunged deeply into the flesh without wincing. Hysterical hemiplegia and paraplegia very often occur. They are very perplexing cases, and can hardly be differentiated by any but a careful and experienced observer. Paralysis of the muscular fibres of the bladder, or spasm of its sphincter, is sometimes simulated. Hysterical patients very often pretend that they are suffering intolerably from retention of urine, and can only be relieved by the introduction of the catheter several times a day; which, indeed, seems to be all that they desire. When such

an affection is made out beyond a doubt to be feigned, it is best to leave the patient to her own resources. Even in cases where this has been done, the patients have been known to drink their own urine in order to carry out the deception. Gravel and stone in the bladder are other diseases simulated; the patient will put common gravel in the urine after it has been voided and pretend to have passed it, or she may even place sand in the urethra. Watson records a case in which a young woman made the surgeons in one of the London hospitals believe that she had stone in the bladder, and who actually submitted to be tied upon a table in the position usually adopted for operations for lithotomy, before a theatre full of students, before the deception was discovered. Hysteria very commonly mimics affections of the spine and joints. Patients have been known to have been kept on their backs for months, and even years, and to have had blisters, leeches, and issues almost constantly applied for supposed disease of the spine, which subsequently was ascertained to be purely nervous. So with hip-joint disease, etc.

There are many hysterical affections referred to the fauces—aphonia or loss of voice, mock laryngitis or pharyngitis, stricture of the œsophagus, and many curious sensations. One patient imagined that a number of tape-worms came up from her stomach to her throat, filled her ears, and came out upon her tongue. Every time she attempted to catch them with her finger they would disappear. This occurred several times a day, and it was impossible to persuade her that such a thing could not happen. Among the other more common affections simulated by hysteria are pleurisy, consumption, cough, hiccup, indigestion, in which the patient swallows a quantity of air, and then pretends to be suffering from tympanitis and eructations; vomiting also sometimes accompanies this hysterical dyspepsia, simulating cancer of the stomach. Very often patients suffering from hysteria have a depraved appetite; they eat very little of anything, especially at table, and will hardly touch meat at all, except it be a little ham; they will devour slate-pencils, wafers, chalk, pickles, lemons, and such out-of-the-way articles. Notwithstanding this mode of life, their health does not materially deteriorate.

We next come to speak of the treatment. This may be divided into two modes—viz. that of the paroxysm, and that between the paroxysms. In the first stage the dress should be loosened and plenty of fresh air admitted into the room. Spectators should not remain in the room, and the attendants should maintain quiet and composure. Cold

water may be dashed in the face; sometimes it is necessary to continue doing this for quite a while (fifteen or twenty minutes), but the patients will generally succumb at last. Strong aqua-ammonia may be held to the nostrils. The bowels may be unloaded with an enema of soap and water, or, better, of *mixtura assafoetida*. Forcibly holding the patient's mouth and nose for a moment, thus suspending respiration, will often divert all the patient's energy to restore breathing, and at once break the attack. When great nervous excitement exists, chloral, bromides, opiates, valerian, musk, etc. may be given at short intervals. In the intervals between the paroxysms, or in the other forms of hysteria, laxatives, tonics, and the correction of any diseased function should be our first care. Iron, in the form of the carbonate, Blaud's and Bland's pills, and the muriated tincture of iron, benefit most cases. Besides this, the patient may take *assafoetida* pills, infusion of quassia, cinchona bark, and quinia.

Ichthyo'sis [Gr. *ἰχθῦς*, a "fish;" *i. e.* "fish-skin disease"], a disease of the human subject characterized by the presence of scaly growths in or upon the integument. Three distinct diseases have been called by this name: (1) Intra-uterine ichthyosis, in which the *vernix caseosa*, or glutinous secretion of the skin of the fetus, becomes hardened into a horny armor, crippling the development of the child and leading to its death. (2) True ichthyosis is a hypertrophy of the papillary layer of the skin and of the epidermis. The patient is covered, as to a great part of the body and limbs, with unsightly scales of forms varying in different patients. This disease is thus far quite incurable. It is generally hereditary, but is not always so. Ichthyosis has been known to cover the skin of the knee after recovery from severe destructive disease of the joint. Frequent bathing and anointing are useful, but never curative. (3) The so-called sebaceous ichthyosis depends on excessive functional activity of the sebaceous glands, the secretion of which rapidly hardens into scales. This disease is often caused by some reflex disturbance, and is curable as a rule.

Il'eus [Gr. *εἰλεός*, a "twisting;" Lat. *volvulus* or *miserere mei*], a very painful disease of the intestine, produced by mechanical obstruction, as by twisting, intussusception, or knotting of the entrail. Intense pain, persistent vomiting (sometimes stercoraceous), hiccough, etc. are characteristic symptoms. Intussusception, or the passage of a part of the intestine into the cavity of another part, is one of the most common conditions, as when the lower part of the small intestine is slipped down into the large intestine. The

disease is very often fatal. Spontaneous reduction of the displacement may occur; the intussuscepted part may slough away and an inflammatory process occur, resulting in recovery; dilatation of the bowels by the bellows may effect a cure. As a last resort, gastrotomy may be tried with possible success.

Impeti'go [Lat. an "attack," from *impeto*, to "rush upon"], a skin disease, resembling eczema in being more or less diffuse inflammation, but resulting, unlike eczema, in pus-formation. The *crusta lactea* of young infants is one of its forms, which are rather numerous. True impetigo is not contagious. It frequently is cured by time alone, but if persistent should be treated with oxide-of-zinc ointment or some other mild stimulant. The so-called *impetigo figurata* is a distinct disease, depending on the presence of *Trichophyton tonsurans*, a parasitic vegetation. Epilation of the part with irritant washes, as of corrosive sublimate, will cure the disease, which is truly contagious.

Indiges'tion, or Dyspepsia [Gr. *δύς*, "bad," and *πέπω*, to "digest"]. Indigestion has many forms, and includes groups of symptoms indicative of departure from one or many of the conditions of healthy digestion. The digestive process is complex, and is performed by the agency of the saliva, the gastric juice, and the intestinal, pancreatic, and biliary secretions. For the proper secretion of these several digestive fluids the blood must be in a healthy state, and be freely supplied to the glandular structure of the stomach and intestines. The innervation essential to the digestive process demands moderation of mental activity, emotional tranquillity, vigor and healthful action of the nervous centres, especially of the sympathetic system. Tonicity of the muscular walls of the stomach and intestine is essential for the thorough contact and admixture of food with the digestive fluids, for its transit through the intestinal tract, and for the regular evacuation from the bowels of undigested and excretory matter. Indigestion may be gastric or intestinal—often the two combined. It is either primary—an essential disorder of the digestive apparatus—or secondary and symptomatic of disease in other organs. Obstruction of the circulation of the blood by chronic disease of a large vascular organ—as the liver, spleen, or kidney—induces passive congestion of the mucous surfaces. Heart disease, rapidity of circulation, and elevation of temperature in fevers and febrile disorders cause gastro-intestinal engorgement, catarrh, and indigestion. When bile is imperfectly eliminated, when urea is imperfectly excreted by the kidneys, when fecal matter is retained and absorbed, the effete elements

circulating in the blood excite gastric or intestinal or gastro-intestinal catarrh. Primary or idiopathic indigestion includes all cases in which careful investigation has failed to discover a dependency on other disease. It may be a simple functional disorder of digestion, or due to an organic cause in some part of the digestive tract. Functional dyspepsia is termed atonic. Organic dyspepsia, if mild and due to temporary and slight lesions of the secretory surface, is termed irritative; if severe, it is designated chronic gastritis, a condition which by associated symptoms and physical exploration may be found to depend upon ulcer, cancer, or inflammatory thickening. Atonic dyspepsia may be due to defective innervation—from continuous and exhaustive mental action; from emotional disturbances, as excitement, sorrow, fear; from prolonged exercise and fatigue; from dissipation. It may be caused by deficient supply and quality of the blood, inactive circulation from indolence and neglect of exercise, anæmia and impoverished blood from privation or recent sickness. Deficient or perverted secretion of digestive fluids results. Reversely, digestion may be interfered with by excess of blood and gastric catarrh, when neglected cleanliness or chilling of the skin or cold extremities determines blood to internal parts. Obesity, indolence, general debility may lower the tonicity of the muscular structure of the stomach and intestines, and weaken the peristaltic movements, causing failure in the contact of food with digestive fluids, and resulting in its accumulation and fermentation. As a rule, however, nerve-force, blood-supply, and digestive apparatus are not primarily at fault, and are adequate to ordinary digestion, the majority of indigestions being the result of gross excesses of diet and violations of hygienic law, excess of food, too frequent meals, rapid eating with incomplete mastication and insalivation, food unfit for digestion or improperly and insufficiently cooked, the habitual use of condiments, rendering the peptic glands dependent upon their stimulus, the imbibition in excess of liquids, as water, tea, or coffee, at meals, causing dilution of the gastric juice. Alcoholic stimulants create temporary and artificial appetite, but soon destroy healthy digestion. Tea, coffee, and tobacco impair the innervation of the stomach.

The chief symptoms of gastric indigestion are sense of fulness, weight, distress, and dull pain over the stomach, coated or irritable tongue, foul breath, perverted appetite—usually poor in the morning, and often morbid and irregular—sometimes nausea and vomiting, eructations of gas, regurgitation of acid or alkaline liquids and of food,

often constipation, and less often colicky pain, with irregularity and looseness. There may exist lassitude, mental inactivity, drowsiness, cranial oppression, headache, vertigo, sometimes clouded vision, diplopia or double vision, and numerous nervous symptoms and perversions of the senses may exist; shortness of breath, sighing respiration, præcordial distress, palpitation and irregular action of the heart. There may be poor circulation; relaxed and pallid or sallow surface and complexion; cold hands and feet; in women, menstrual disorders. With the more marked and aggravated symptoms there may be mental depression, anxiety, despondency, and apprehension, constituting hypochondria. A diagnosis of the form of dyspepsia is essential to a correct treatment. Atonic may be distinguished from irritative dyspepsia by the following differences:

In Functional or Atonic In Irritative Dyspepsia.
Dyspepsia.

- | | |
|---|--|
| 1. Deficiency or irregularity of appetite, absence of thirst. | 1. Morbid craving for food, morbid thirst. |
| 2. Ingestion of food affords sense of comfort for a time. | 2. Ingestion of food causes distress. |
| 3. Food retained. | 3. Food often ejected when taken, or soon after. |
| 4. Condiments and stimulants craved, aid digestion, and cause sense of comfort. | 4. Condiments and stimulants create or intensify distress. |
| 5. Languor and inaptitude for exertion during digestion. | 5. Pain and mental distress during digestion. |
| 6. Tongue pale, broad, flabby, thinly furrowed. | 6. Tongue small, compact, red, with elevated papillæ or sensitive abraded patches. |
| 7. Breath foul. | 7. Breath may or may not be foul. |
| 8. No fever. | 8. Often slight fever. |
| 9. Persons in general good health and flesh. | 9. Reduced health, bad nutrition, and emaciation. |
| 10. Constitutional symptoms few. | 10. Variable general effects. |

The symptoms of functional and irritative dyspepsia often coexist. In functional dyspepsia the fermentation of food develops gases. Eructations may be of carbonic acid gas from acetous fermentation, of hydrogen and carbonic acid gas from decomposition of hydrocarbons or fatty food, or of sulphuretted hydrogen from decomposition of nitrogenous substances, as meats, eggs. Of regurgitated liquids, the most common is a clear, opalescent, insipid, alkaline liquid, sometimes saltish or brackish, probably the accumulation in the œsophagus of saliva, and its frequent rising in the throat is known as waterbrash or pyrosis. In gastric catarrh gelatinous mucus may rise in the throat. The regurgitation of acid, acrid liquid causes sense of burning in the stomach,

beneath the sternum, and in the throat—technically, cardialgia, popularly termed heartburn. Such fluid is usually serum or sero-mucus, containing acetic or lactic acid. If brown, acrid, bitter, rancid, and offensive, it is due to the conversion of fatty food into butyric acid. Food may be regurgitated at various stages of its digestion. When food is ejected many hours after ingestion, it may present products of fermentation—sporules of *Torula cerevisiæ*, or sporules aggregated into segmented, cubical masses, known as *Sarcinæ ventriculi* (sarcina, a "wool-pack"). Coffee-ground substance in ejecta is due to blood which has undergone gastric digestion, and indicates an abraded, ulcerated, bleeding surface. The accumulation of food and its ejection *en masse* hours after ingestion denote obstruction at the lower or pyloric orifice. The prevalent idea that gastric juice is often regurgitated is erroneous. Bile appears in regurgitated fluids seldom, and in vomited matter only after prolonged or violent emesis. In aged persons a steady progressive loss of appetite, progressive inanition and emaciation, and death from slow asthenia, without other symptoms of indigestion or evidence of disease in other organs, result from degeneration of the gastric and intestinal tubules, the peptic glands. When fatty food passes in the feces undigested, disease of the pancreas may be suspected.

Atonic dyspepsia predisposes to acute indigestion, sub-acute gastritis, gastro-enteric catarrh—the cholera morbus of adults and cholera infantum of children—whenever exciting causes are superadded, as the imbibition of cold water or eating acrid fruits, chilling of the heated body in summer. Indigestion may at first induce looseness of the bowels, irregular action, or diarrhœa, but ultimately produces constipation. Indigestion, by developing lactic acid in excess, is the frequent cause of rheumatism. It is the source of the lithic-acid or gouty diathesis. Indigestion is the frequent cause of urinary precipitates. Imperfect digestion of nitrogenous food gives rise to oxalic acid, oxalate of lime in the urine, irritation and congestion of the kidneys and bladder. Indigestion in young and susceptible children and infants is the most frequent cause of convulsions and sudden febrile attacks. It may be the chief or only cause of chorea (St. Vitus's dance). Chronic irritative dyspepsia is most often the result of alcoholic excess, less often of excessive errors of diet, or may be symptomatic of gastric ulcer, pyloric constriction, or malignant disease.

In the treatment of indigestion regulation of diet alone often effects a cure. The diet should be nutritious, moderate in quan-

tity, taken at regular intervals, and slowly eaten. The food at breakfast should be simple and laxative, at dinner substantial, at supper light. Of dishes there should be variety, yet simplicity, including animal food, vegetables, and fruits in restricted quantities. Bread should be stale or aerated. Milk may be freely taken, corrected with soda or lime-water. Fatty food, grease, sugar, and pastry should be avoided. Artificial adjuvants to the diet, as Liebig's prepared food, Ridge's food, and malt extract, are of value. Drink of any kind at meals should be very limited. Attention to general regimen is essential. There must be outdoor exercise, freedom from mental stress, from physical fatigue, and dissipation in any form. By clothing, active friction, and judicious bathing the external circulation is kept vigorous. Tendency of the food to decompose demands correctives. For the acid stomach, bicarbonate of soda, the bicarbonate of potash, or lime-water; for alkaline fluid and gastric mucus, dilute mineral acids and acidulated drinks. Bismuth, either the subnitrate or subcarbonate, is the remedy for pyrosis. When the stomach fails to digest albuminoids, pepsine may be given. Pancreatine will aid the intestinal digestion of fat. Fermentation of food, with fetid products and foul breath, may be treated by the sulphite, bisulphite, or hyposulphite of soda, the sulpho-carbolate of soda; charcoal is also efficacious. In atony of the stomach, carminatives, as ginger, calamus, capsicum, and compound tincture of cardamum, stimulate glandular secretion; bitter vegetable tonics, chamomile, quassia, calumbo, gentian, wild-cherry bark, cascarrilla and cinchona barks, create appetite, and nux vomica increases the muscular tone and activity of the stomach and intestines and prevents flatulence. Quinine and ferruginous tonics, as the citrate of iron and quinine, the lacto-phosphate and carbonate of iron, and Bland's pills produce general vigor, improve the blood, and aid digestion. Laxatives are essential when constipation exists; violent cathartics are to be avoided. Laxative food, as the coarse cereals and ripe fruit before breakfast, may be tried. Tamarinds and figs, St. Germain tea, senna, and magnesia may be used to stimulate the bowels to action. Often active exercise, walking, or horseback riding will suffice. Rubbing and kneading the bowels or the application of electricity to the abdominal muscles will cure obstinate constipation. Rhubarb, podophyllin, or dried ox-bile in small quantities may be needed to increase the secretion of bile, aloes to unload the rectum, belladonna and nux vomica to create permanent tonicity and regular action

of the bowels. A judicious combination of these remedies in a tonic-laxative pill may be taken until the stomach and intestines resume healthy and vigorous activity. Saline purges are to be avoided. But the milder mineral waters may be taken when acid indigestion is present or there is a personal tendency to rheumatism or gout.

Inebri'ety [Lat. *inebriare*, "to make drunk"], in the present acceptance of the term, is used to denote the diseased condition of the system produced by the habitual use of alcohol. Its synonyms are *alcoholism*, *dipsomania*, and *oinomania*. Alcohol introduced into the circulation acts upon, and to a certain extent destroys, the red corpuscles of the blood, and thus, secondarily, affects all the organs of the body. Its most common mode of introduction into the system is in the form of spirituous and fermented drinks; and in those addicted to its habitual use the principal lesions are chronic hyperæmia and subsequent softening of the brain, cirrhosis and fatty degeneration of the liver, fatty degeneration of the kidneys, and fatty degeneration of the heart. Formerly, inebriety was regarded as a crime, but within a few years science has shown it to be a disease, and institutions have been established for its treatment and cure. Statistics from these institutions have demonstrated—I. Inebriety is a disease, and is curable. II. Relapses may or may not occur. The patients in hospitals for the treatment of inebriates may be divided into three classes—viz. I. Those who by social indulgence, without hereditary taint, have become inebriates. These, as a class, are curable by the aid of an institution. II. Those in whom the disease is inherited, in which cases it manifests itself in paroxysms ("sprees") at variable intervals. These are more difficult to restore to health. III. Those who seem totally depraved in all their instincts, and exhibit no desire for restoration to health. These, as a class, are incurable, and should, for the protection of society, be placed under permanent restraint in institutions distinct from those of a reformatory character. Carefully prepared reports from hospitals for inebriates show that a very large percentage (between 50 and 60) of the patients treated in them are restored permanently. (See DELIRIUM TREMENS, DIPSO MANIA, INTOXICATION, METHOMANIA.)

Infantile Paral'ysis, paralysis of a muscle, group of muscles, a limb or side, coming on suddenly in an infant or young child. It is due to congestion of the brain or spinal cord, often excited by the irritation of teething, indigestion, or constipation. Most cases are temporary, others leave squint, club-foot,

paralysis, and shortening of a limb. The affected member must be exercised by kneading and electricity, to prevent its wasting while time permits the lesion of the nervous centre to be removed. Cod-liver oil, iron, tonics, and out-of-door life are the requisites. (See articles CLUB-FOOT and SQUINTING.)

Inflamma'tion [Lat. *inflammo*, *inflammatum*, to "kindle," *flamma*, "flame"], a morbid process characterized by heat, redness, pain, and swelling. The predisposing cause may be anything which tends to influence injuriously the animal economy—plethora or anæmia. When a part has once been the seat of inflammation, it is very liable to be affected again under the slightest exciting cause. Age is a predisposing cause of inflammation; in infancy the parts most subject to become inflamed are the bowels, pharynx, larynx, and brain, whereas during adult life these parts are seldom affected, the favorite seat then being the lungs, heart, urinary apparatus, etc. Sex exerts a certain influence; a female is more apt to suffer from peritonitis, phlebitis, or cellulitis in consequence of the parturient act. So the temperament, food, occupation, climate, etc. all influence, to a greater or less extent, the susceptibility of the individual to be attacked by inflammation. The exciting causes may be divided into the constitutional and local; the former includes all those agents which are capable of rendering the blood impure, as poisonous gases, cold, heat, etc. The local cause is generally an injury of some kind, either chemical or mechanical. Every vascular part may be the seat of inflammation, and usually in proportion to the amount of its vascularity. It also seems necessary that nerves should be present. Cartilage contains no nerves and but few vessels, and is therefore rarely the seat of inflammation. Epidermis, hair, and the nails are never inflamed, being destitute of blood-vessels, nerves, and lymphatics.

Inflammation is generally divided into the acute and chronic varieties; the former runs a rapid course and is attended by well-marked symptoms—pain, heat, redness, and swelling. These have been given as the symptoms of inflammation from the time of Hippocrates. The swelling is caused by enlargement of the vessels, and more particularly from serous effusion, which takes place into the adjacent tissues; at a later period we have plastic exudation, which in the end tends to lessen the size of a part. The redness is a leading feature, and is due to enlargement of the vessels and an increase of the coloring-matter of the blood. Pain is not essential to the disease—pneumonia and encephalitis are not painful dis-

eases—but external inflammations are always attended with pain, which is due to pressure upon the ultimate sensitive nervous filaments. Serous membranes stand next to fibrous structures of joints in the severity of inflammation, although we may have serous membranes inflamed without pain, as in puerperal peritonitis. The heat is a direct result of hyperæmia. It is chiefly felt in external inflammations; the part receives more blood, and is consequently of a higher temperature, than the rest of the surface, but it never rises above the heat of the blood. Acute inflammation is always attended by more or less fever, which may be ushered in by a chill. The pulse runs up to 100–120, the respirations are increased in number to 25 or 30 per minute, and the temperature is raised to 102°–104° F.; the secretions are suppressed, and there is headache and sometimes delirium. Many attempts have been made to ascertain the exact changes which take place in a part attacked by inflammation by artificially producing an inflammation in the web of a frog's foot or the wing of a bat, and closely watching the changes under a powerful microscope; these observations have led to the following conclusions: In inflammation the first change is in the ganglionic system of nerves, but of this system we know nothing except its effects. This nervous system influences the various determinations of blood, as seen in blushing and the local temporary engorgement of nervous women; as also congestions, which are not mechanical in their cause, but occur from a passive state of the vessels. Next we will notice the changes which are seen to occur in the blood-vessels. There is at first active congestion of the part, and this condition is caused by internal or external irritation. Soon stagnation is observed to take place at points. In the natural state the red blood-corpuscles never touch the walls of the capillaries, but in inflammation this rule no longer obtains, and they begin to adhere to the walls and to each other. This is known as the *stasis*; as it increases the vessels continue to dilate, and very soon after the *stasis* is established the vessels begin to exude their contents, which make their appearance amongst the tissues. This exudation is not a coagulation of the blood as seen outside the body; it is serous at first, but is soon followed by an effusion of lymph or liquor sanguinis, which, according to the old theory, might be organized into false membrane or degenerate into pus, it depending on the tissues involved and the constitution of the patient. At the present time, however, Cohnheim's theory of the formation of pus is the one generally received—viz. that the

corpuscles are identical with the white blood-corpuscles, which are exuded through the walls of the vessels. In process of time the false membrane becomes smooth. It has not yet been ascertained whether nerves are formed in the tissues or not. Two theories are given to account for the formation of vessels in these new productions—viz. Vogel's and Hunter's. Vogel believes that he has seen the membrane itself produce the blood, and afterwards the vessels to contain this blood, and he says that finally these new vessels communicate with the old ones. Hunter believes that the new vessels are given off from the old ones. After vessels have been formed in these new tissues contraction commences, and both the membrane and the vessels become smaller and firmer. This contraction sometimes proves a serious matter, as in the contraction of bands around the intestines, especially in the neighborhood of the rectum; the effects of the contraction are also serious about the pericardium, causing at times hypertrophy of the heart; the pleura suffers least from it.

The duration and character of the inflammation vary with the condition of the part affected and the constitution of the patient. When once fairly established, it may destroy life by exhaustion or by interfering with the function of some important organ, as the lungs or heart. It may also terminate in resolution, suppuration, or mortification. Resolution consists in the restoration of the affected part to its normal condition without suppuration having taken place. It is by far the most favorable termination of inflammatory action. Suppuration consists of the formation of a fluid called pus, as described above; it is a yellowish liquid, in which float numerous small round granular corpuscles. When the pus is thin, dirty, and acrid, it is called *ichor*. When suppuration continues for any length of time, it gives rise to a fever known as hectic fever. This is diurnal in character, commencing with a chill, followed by a fever, and then sweating. The chill lasts from half an hour to an hour, the fever from one to two hours. In a great many cases the three stages are not well marked, one, or even two, of them being oftentimes omitted. The inflammatory action may be so intense as to deprive the part of its proper supply of blood, and so cause ulceration and mortification (see GANGRENE); this condition is attended by a symptomatic typhoid fever, the symptoms of which are—dry tongue with sordes, trembling, restlessness, delirium, *muscæ volitantes*, pulse feeble, small, and frequent, involuntary evacuations.

Treatment of Inflammation.—We have local and constitutional means for combating this condition; sometimes one alone will do the work, but generally we employ them conjointly. The first thing to be done is to remove the cause, if discoverable; if not, the bowels should be freely moved once a day, and the skin and kidneys be made to act by the administration of diaphoretics and diuretics. Careful attention should be paid to the diet and regimen of the patient, and heat and moisture applied to the inflamed part, either in the form of poultices or spongiopyeline or the hot-water bath. If the patient be plethoric and the pulse hard and full, it will be a great benefit at times to bleed him. This practice has been much decried of late, but surgeons are not very averse to local blood-letting, which may be done by scarifications with a lancet, by wet or dry cupping, or leeches. It seems to afford instant relief to the patient by removing pressure and consequent irritation of the inflamed part. Cold evaporating lotions continuously applied are a great relief. They cause the capillaries to contract, and thereby diminish the afflux of blood.

Inflamma'tion of the Bow'els. See PERITONITIS.

Inflamma'tion of the Brain. See BRAIN FEVER and MENINGITIS.

Inflamma'tion of the Kid'neys. See BRIGHT'S DISEASE and RENAL DISEASES.

Inflamma'tion of the Liv'er. See HEPATITIS.

Inflamma'tion of the Lungs. See PNEUMONIA.

Inflam'matory Rheu'matism. See RHEUMATISM.

Influen'za [It.; as if produced by the influence of the stars], an essential, infectious, epidemic febrile disease, characterized by a variable degree of constitutional disturbance, especially nervous depression, and having a local expression in irritation and catarrhal inflammation of the air-passages and their appendages. The name "influenza" is Italian, indicating "the influence" of a prevailing atmospheric cause. In France it is termed *la grippe*, from *agripper*, to "seize," indicating the sudden, precipitate onset of the epidemic and of the individual attack. It is also termed epidemic catarrh, epidemic bronchitis, and, better, epidemic catarrhal fever. It is described as first prevailing in Europe in the tenth century, and later in the years 1311, 1387, and 1403. But its certain and undoubted record begins with the epidemic of 1510. Since that time to the year 1875 there have been ninety-two epidemics, of variable severity and at irregular intervals. These epidemics are singularly uniform in identity of characteristics and in

obedience to law of origin and diffusion. The disease appears suddenly in the E. or N. E., usually in the N. of Europe, exceptionally in the Indies or Northern Asia, and travels to the W. It travels in cycles, invading the whole of Northern Europe, often extending to America, and exceptionally felt in the equatorial regions and the southern hemisphere. Unlike cholera, its diffusion does not depend on human commerce. Its progress is rapid, a great wave from E. to W. precipitating itself upon communities and countries with a suddenness warranting the names popularly applied to it—"lightning catarrh," "le petit courrier," "la grippe." Less often it appears coincidently at places far removed, as at the Cape of Good Hope and London in 1836. In its zone of progress it often appears simultaneously at many isolated foci, from which it seems to radiate until disseminated over vast areas. Its influence is not confined to the continents, but is immediately exerted at mid-sea upon all who sail into the districts of atmospheric infection. Appearing in a community, it attacks a majority of its members, of both sexes, of all ages and social position, and with a rapidity precluding the idea of communicability. No nationality is exempt, and as a rule only a fractional part of the population escapes its effects. It would appear to attack preferably women, next adult males, and lastly children. In some epidemics children are exempt. During the prevalence of influenza the animal vitality is lowered, the type of other diseases is modified, assuming adynamic or typhoid forms, and tending to a greater general mortality. Influenza is not confined to man, but often extends its epidemic influences to the domesticated animals, especially the horse, and is known as the *epizootic*. In England the epidemics of 1728, 1732, 1733, 1737, 1743, 1803, 1831, and 1837 were accompanied by the epizootic among cows, horses, and dogs. The pestilential epizootic extending throughout the U. S. in 1872-73, attacking in New York 16,000 horses, was an epidemic of influenza, prevailing with great severity. The influenza is first recorded in America in 1577. The chief epidemics in Europe have extended to this country. The most noticeable ones are that at the close of the war of 1812, those of 1843, of 1872, and the recent season 1874-75, in which pneumonia has existed as a frequent and fatal complication. Of the intimate nature of the subtle atmospheric or telluric cause of influenza nothing is definitely known. Schönbein regarded an excess of ozone in the air as producing bronchial irritation. Prout attributed the disease to selenuretted hydrogen. Much has been written of its concurrence with the ap-

pearance of comets and meteoric showers, and the opinion is in favor that electrical and magnetic disturbances of the atmosphere are related to the epidemics. The advocates of the "germ-theory of disease" regard influenza as due to the wide dissemination, by air-currents, of animalculæ or cryptogamic vegetable products—malarial emanations. Ehrenberg describes "dust-fog currents" in the higher strata of the atmosphere, from which many genera of animalcules may be collected. The epidemic of influenza occurs at all seasons of the year, often in the spring, and in both warm and cold, in dry and damp or foggy weather. The usual duration, in one locality, of an epidemic is from four to six weeks, exceptionally much longer. There may be local recurrences in the same season, but as a rule the victims of the first are exempt from the second attack.

As regards the disease, it is thought that a specific poison is absorbed and circulates in the blood, irritating the nerve-centres, producing prostration and febrile disturbance, and causing hypersecretion and inflammation of the mucous lining of the air-passages. The symptoms vary in severity in different epidemics and in individual cases. The onset is sudden, announced in severe cases by a marked rigor, more often by chill and shivering, alternating with flashes of heat. Then follow general lassitude, debility, nervous prostration, soreness and stiffness of the limbs, pains in the neck, back, and loins, headache, frontal oppression, pain in the orbits, cheek-bones, and root of the nose, injection and sensitiveness of the eyes, with copious flow of tears—often heated, the "fiery tears" of the early records—sneezing and tingling, followed by watery and often acrid discharge from the nose, soreness of the tonsils, Eustachian tubes and ears, experienced in swallowing, hoarseness, a short, frequent, harassing cough, with slight expectoration, and a slight fever of the remittent form, having its exacerbation towards evening. The fever is seldom pronounced, but the restlessness, irritability, exhaustion, and mental depression are marked, and usually disproportionate to the bronchial complication. In other cases there is soreness, tightness, and pain beneath the sternum, dyspnoea, sense of suffocation, and danger of capillary bronchitis or pneumonia. These unfortunate complications are the chief causes of death from influenza, and occur mainly in the aged, in invalids, and in delicate children. The usual duration of mild cases is from three to five days, of grave cases from seven to ten days. The termination of the disease is often as sudden as its onset, and frequently occurs with a critical and profuse perspiration or diarrhoea.

The mortality from uncomplicated influenza in healthy persons is very slight. Influenza has no pathology indicative of its specific nature, and presents only the lesions of the associated catarrh—tumefaction and redness of the mucous lining of the nose, the tear-duct, and eyelids, the frontal and maxillary sinuses, of the throat, Eustachian tube, and membrana tympani, of the larynx and bronchial tubes, and the lesions of pneumonia when it exists. The majority of cases are mild and require no treatment. A purge at the outset may shorten their duration. More marked cases require a preliminary purgative, a low diet, the avoidance of exposure to cold, resort to hot draughts, as of lemonade or elder-bloom tea, to stimulating foot-baths, to the use of Dover's powder, Tully's powder, spiritus Mindereri, or other remedies to secure free perspiration, and the relief of bronchial congestion by inhalation of steam, by ammonia, or by stimulating expectorants. Headache and distress in the nose and orbits, due to irritation of the Schneiderian membrane and its processes, may be relieved by the inunction of oil or grease or by the insufflation of warm anodyne solutions. Quinine in doses of five grains three times a day, if taken at the beginning, may cut short the attack. When the bronchitis tends to become capillary, quinine or tincture of bark is indicated to support the strength, ammonia to favor the liquidity and discharge of mucus, and the oil-silk jacket to favor free secretion. The extensions of pneumonia may be limited by arterial sedatives, carbonate of ammonia, quinine, and anodyne poultices or fomentations. It is essential to proper treatment to remember that blood-infection is primary and bronchitis or pneumonia is secondary; the constitutional disease will admit of no depressing remedies, and the speedy termination of the inflammatory complications will follow supporting measures. During epidemics of influenza the aged and feeble should keep within-doors in well-warmed rooms, and partake of quinine, ammonia, and guarded but nourishing diet, as measures of prevention.

Intem'perance. See DELIRIUM TREMENS, DIPSOMANIA, INEBRIETY, INTOXICATION, and METHOMANIA.

Intermit'tent Fe'ver, Ague, Fever and Ague, an essential, periodic fever resulting from infection of the blood by malaria or marsh-miasm. Malaria emanates from decomposing vegetable matter exposed to the action of the air and the sun's heat. It exists in swampy districts and in low, damp, undrained places, upon the banks of rivers, upon inlets of salt water, where variable water-level and tides expose a saturated

soil to the atmosphere. Malaria is most concentrated and intermittent fever most prevalent and severe in the tropics, where vegetation is luxurious, and a soil enriched by decaying plants and falling foliage is subjected to the extreme influences of alternate seasons of rain and drought. In temperate regions it is present in new districts, disappearing as the land is populated, cultivated, and drained. It may appear in cities by the exposure of marshy subsoil when excavating to build, or by the escape of malarial air from defective street-sewers constructed in a swampy substratum or emptying on a malarial water-course, whose tidal changes dam back marsh-miasm, to escape in the various quarters from which the sewers extend. Intermittent fever occurs in paroxysms separated by intermissions or non-febrile periods. The paroxysms may recur daily, constituting the "quotidian" form, or on alternate days, the "tertian" form, since it recurs on the third day, including the previous attack. There is also a "quartan" form. Exceptionally, there may be a "double quotidian," with one strong and one mild attack each day; a "double tertian," with a daily onset, that of every second day being relatively weak; a "double quartan," having two attacks in every three days. Febrile paroxysms usually recur at a definite hour each day or alternate day. A recurrence of successive paroxysms at an earlier hour for each attack is termed "anticipating," and indicates an increasing malarial influence. When the paroxysms come at a later period, with successive attacks, it is termed "postponing" or "retarding," and indicates a subsidence of the malarial influence. Paroxysms may occur a few hours after exposure to malaria or after a period of incubation as long as two weeks. A paroxysm has three distinct periods or stages: (1) cold stage; (2) hot stage; (3) sweating stage. The average duration of the cold stage is one-half to three-quarters of an hour; it may be a few moments or two to three hours. It begins with shivering, chilliness in the loins, extending to back and limbs, muscular tremor, the lips quiver, teeth chatter, and the whole body is shaken. The respiration is sighing, the pulse feeble, the face pale or livid, the nails livid, the fingers waxen and cold. The general surface is pale, cold, often shrivelled. The thermometer in the mouth or armpit, however, reveals an increased temperature of the blood even in the cold stage, the blood having been expelled from the skin and extremities by the involuntary contraction of the elastic tissues of the skin. During the first stage there is therefore a determination of blood to internal organs, which may be

dangerously congested, constituting the "pernicious" or "congestive" forms. Headache, vomiting, tenderness over the liver and spleen, are symptomatic of such congestion. The transition from the cold to the hot stage is gradual; chilliness ceases, flashes of heat are felt, "the coldness melts away." The skin becomes hot and red, pulse full and bounding, the face flushed, headache increases, the temperature of the surface may be 105° or 106° F. The duration of the hot stage is from three to eight hours. The third or sweating stage at first is gradual; moisture appears on the face, soon on the trunk and extremities. Heat, headache, thirst, and restlessness subside, the temperature falls rapidly, the person is drowsy, falls into long and refreshing sleep, with profuse or slight sweating. The duration of this stage is from three to four hours. During the intermissions or apyrexial periods there may be good health, or in graver cases impaired digestion, debility, pallor, or sallow, cachectic complexion. Malaria impoverishes the red corpuscles and lessens the albumen of the blood. Intermittent fever tends to recur when incompletely cured, either in marked paroxysms or in less pronounced "latent," "masked," "concealed" forms, vague symptoms of chilliness and weariness known as "dumb ague," or in periodic neuralgia. The spleen is often permanently enlarged, and is termed "ague cake." The periodical recurrence of the paroxysms is due to successive efforts at elimination, the interval being the time required for the zymotic material of malaria to redevelop and impress the system.

The paroxysms require no treatment other than warm drinks and blanketing during the cold stage, cooling drinks and sponging during the febrile or hot stage. The treatment for the prevention of the paroxysms is to be in the periods of intermission. The chief of remedies is the Peruvian or cinchona bark, and the alkaloids derived from it. Quinine is mostly used in the form of the sulphate and bisulphate, less often the muriate. Cinchonine is an alkaloid resembling quinine, but less powerful. The mother-liquor from which these alkaloids are precipitated is evaporated, and an impure, crude sediment, in part quinine and cinchonine, and mainly quinidia and cinchonidia, or amorphous alkaloids, is obtained, and is much used—known as "chinoidine." Salicine, the alkaloid of willow bark, berberine, piperine, apiol, eucalyptus, and other vegetable substitutes are weaker and less efficacious than quinine. Crude or unbleached quinine, an inexpensive article, has recently been ascertained to have the full efficacy. Quinine is given either in one full

dose of ten or more grains or in divided doses of five grains three times a day to break the paroxysms, and continued in smaller doses for many days to prevent their recurrence. Fowler's solution of arsenite of potash is second only to quinine in power. Nitric acid, sulphites of soda, ferrocyanide of iron, chloride of ammonium are also used. The patient may be more efficiently and permanently cured by combining cholagogue cathartics, and subsequently employing iron and tonics generally. The prevention of intermittent fever is to be sought by soil-drainage, by avoiding damp night air, and sleeping in closed rooms well above the ground. The sunflower freely planted adjacent to dwellings has been considered protective by absorbing malaria, and more recently the *Eucalyptus globulus*, or Australian fever tree, has been extensively planted in Algiers, at the Cape of Good Hope, and in Cuba, and is asserted to lessen, or even eradicate, malaria by its presence.

Intoxica'tion [Lat. *in*, and *toxicum*, "poison"], the cumulative effect of an acro-narcotic poison on the nervous centres. The term is most commonly used to designate the condition of a person who has been brought under the influence of *alcohol* by successive imbibitions during a short space of time, but should not be confined exclusively to the poisoning by alcohol; opium, stramonium, cannabis indica, and all the poisons belonging to the above-mentioned class, will produce intoxication when taken in sufficient quantity.

Intoxication may be divided into the acute, sub-acute, and chronic varieties. Acute intoxication is a disease very rarely seen, even by the physician. It is produced by drinking a large quantity of some spirituous liquor in a very short space of time. This is followed soon afterwards by sudden coma (loss of sense, sensation, and voluntary motion), which may be complete or incomplete. We have present here the symptoms of coma—viz. stertorous respiration, dilatation of pupils, frothing at the mouth, etc. Unless assistance speedily arrives these symptoms generally terminate in death in from half an hour to five or six hours. Every endeavor should be made to arouse the patient from his lethargic condition. An active emetic, as sulphate of zinc, may be administered, or, better still, the stomach-pump should be used to evacuate the stomach. Ammonia may be given as an antidote, and if the patient be able to swallow he should take large draughts of tea. The sub-acute form may be seen any and every day in the week. It is the ordinary form of intoxication indulged in by persons either voluntarily, for the pleasant and exhilarating

effect on the senses during one of its stages, or involuntarily, in consequence of a depraved appetite growing out of the former method. We see some men—and, unhappily, women also—who are seldom or never in a sober condition; others who imbibe a little at all times, and get intoxicated whenever they are under undue excitement or depression; and still others who "go on a burst" once every three, six, or twelve months, and in the mean time totally abstain from any of the intoxicants. To this class belong those individuals who inherit the tendency to inebriation. Alcohol, taken to a degree to produce sub-acute intoxication, excites the vascular and nervous systems; all the secretions are at first arrested, and the temperature of the body is lowered, and not, as has been generally believed, increased. If taken by a person who is not accustomed to it, it occasions derangement of the stomach, and nausea and vomiting are the result. The principal effect, however, is noticeable upon the nervous system. There is a general feeling of increased physical power, and the mental faculties are exhilarated. The patient at first talks rationally, but is very verbose and grows confidential. Incoherence follows upon this, and then delirium and sopor. The effect is also seen on the cerebellum by the impairment of the power of co-ordination, causing at first the staggering gait, and ending in complete loss of muscular power. When this stage occurs the individual generally falls into a deep sleep, from which it is almost impossible to waken him. When consciousness is restored there is a feeling of depression, which the patient seeks to relieve by a resort to stimulants. Little can be said of the palliative treatment of this variety of intoxication. With the exception of the employment of emetics to unload the stomach, and the administration of ammonia and tea as antidotes, the patient should be allowed to "sleep it off." (For the chronic effect of acro-narcotic poisons see INEBRIETY and METHOMANIA.)

Itch. See SCABIES.

Jail Fe'ver, a form of TYPHUS (which see).

Jaun'dice. This is a greenish-yellow color of the skin which is produced by the presence of the coloring-matter of the bile in the blood. It is not a specific disease, as is generally supposed by the laity, but a symptom, which, taken in connection with other symptoms, points to the affection which gives rise to it. We might as well speak of vomiting, headache, etc. as diseases: they are not, but merely prominent symptoms of many varied morbid processes. If jaundice occurs in any great abundance, or persists for a length of time, we find all the secretions tinged with

the bile, the urine becomes saffron-colored, and the stools, being deprived of their coloring-matter, are whitish. We may have jaundice produced in two ways—either from suppression or retention of bile; the former is due to some disease of the liver which incapacitates it for performing its function; therefore the bile, which in the healthy state of the organ is constantly being filtered from the blood, accumulates in it. Jaundice from retention of bile is produced in this way: The bile, having been already formed, is prevented from making its way into the intestines by some obstruction in the bile-ducts; it is therefore re-absorbed, and again makes its appearance in the blood. The obstruction to the ducts may be either external or internal. Externally, we may have tumors of various kinds pressing on the ducts, as cancer of the pyloric end of the stomach, of the duodenum or the end of the pancreas, or a colon impacted with feces. Internally the gall-duct may be plugged up by mucus, or, what is far more common, by a biliary calculus passing through it; this is accompanied by a great deal of pain; indeed, it is said to be the most severe pain that can be felt. Some idea of it may be had from a knowledge of the fact that the common bile-duct is very seldom larger than a goose-quill, and the stones which pass through it are seldom smaller in diameter—sometimes attaining the size of a pigeon's egg. Accompanying the jaundice and pain in these cases we have nausea, vomiting, hiccough, flatulence, and in the intervals between the intensity of the pain the patient is exhausted and drowsy. There is generally much more pain felt by the passage of a calculus for the first time than subsequently, as the ducts are generally left distended for its successors. Besides the above forms of jaundice there is also a malignant form, which is analogous to typhoid, yellow, or remittent fever, and is marked by typhoid symptoms from the beginning of the attack, and is accompanied by hemorrhages from the mucous membranes and skin. It almost always ends fatally. In jaundice from suppression the urine only contains those ingredients of the bile which pre-exist in the blood—viz. the bile coloring-matter and cholesterine; in that from retention we also have the bile-salts which have been formed in the liver, and afterwards absorbed and eliminated by the kidneys. To determine the former, nitric acid is generally added; it produces a bright grass-green color with the coloring-matter of the bile. The bile-salts, however, can only be detected by Pettenkofer's test, which is as follows: To the suspected liquid add a few drops of a solution of cane-sugar, and

then slowly, drop by drop, sulphuric acid; at first a red color will be produced, which will afterwards change to a lake, and then to a deep purple.

The technical name of jaundice is *icterus*, from the Greek name of the golden thrush, which, according to Pliny, when seen by a jaundiced person would die and the patient recover. Now, however, we treat the affection more scientifically, looking to its origin. Where it is due to suppression little can be done except in cases of acute inflammation of the liver, but in those cases due to obstruction there is more success with it. The indications are to improve the patient's general condition by a proper and nutritious diet. Fats of all kinds should be avoided, as they cannot be digested without the assistance of the bile. Next, we should attend to the constipation from which these patients almost invariably suffer; for this rhubarb, senna, and aloes are the favorites. Opium should be given to relieve the intense pain. After the removal of the obstruction we may hasten the disappearance of the jaundice, and the annoying itching which accompanies it, by steam and alkaline baths.

Joints, Diseases of. See ANKYLOSIS, HIP-JOINT DISEASE, SYNOVITIS, HOUSEMAID'S KNEE.

Kid'ney Diseases. See RENAL DISEASES.

Laryngi'tis [from Gr. *λάρυγξ*, "larynx"], an inflammation of the mucous membrane lining the larynx. It may be divided into acute and chronic forms. Acute laryngitis generally commences as an inflammation of the pharynx, which is afterwards communicated to the larynx, although it does occur independently in the larynx itself. The cause is generally "a cold," or exposure to sudden changes of temperature, or it may be traumatic; and the symptoms consist of hoarseness, a sensation of tickling and dryness in the throat, and more or less cough and expectoration. With ordinary care it subsides in a couple of days without any medical interference, or at most a warm bath followed by gentle diaphoresis. In very severe cases inhalations of infusion of hops may be used every two or three hours with decided advantage, but we should be very wary about making astringent local applications with a sponge or brush. Simple chronic catarrh of the larynx is usually a sequela of the acute form, or arises by extension of a similar inflammation of the pharynx and posterior nares. The symptoms are somewhat similar to those of the acute form, though not as well marked, and in addition there is an almost constant hawking and hemming kept up by the patient to clear his throat from the continually accumulating mucus. In

the treatment of this, as in that of all inflammations, the first indication is to remove all irritation, and the patient should be cautioned against swallowing large masses of food at a time, or, what is a very common practice in this country, partaking of very warm dishes, followed by large draughts of ice-water. All the food taken should be of equable medium temperature, neither too hot nor too cold, and the inhalation of hot and cold air and noxious vapors, dust, etc. should be avoided as much as possible. Besides all this, the general health should be by no means neglected, and local medication seems to be very beneficial. Standard solutions of nitrate of silver, sulphate of copper, perchloride of iron, iodine, etc. are those most commonly used; they seem to produce a better result when changed from time to time, and the application should be made by means of a camel's-hair brush from twice to five or six times weekly.

Laryngeal phthisis occurs in connection with pulmonary phthisis; the symptoms differ little from those of an ordinary laryngitis, but upon examination the cartilages are found thickened, and often there is ulceration affecting both them and the cords. Syphilitic laryngitis exists as a manifestation of that dire affection, syphilis. It is principally from the previous history of the case and an exploration of the chest that we differentiate it from laryngeal phthisis. Sometimes the destruction of tissue is appalling. In the latter two varieties the chief reliance must be placed on the constitutional treatment of the disease of which they are but symptoms; but still, local medication should not be ignored. In ulcerative laryngitis, from whatever cause, powdered iodoform seems to have the most beneficial effect. (See THROAT DISEASES.)

Lead'-Poisoning, a diseased condition resulting from the presence of a considerable amount of lead in the system. This condition is induced in various ways: (1) By the use of lead pipe for the conduction of drinking water. Happily, a large proportion of the waters used for drinking and cooking have not the power to take up lead in solution, but there can be no doubt that a very great number of cases of lead-poisoning are induced in this way. (2) By the use of lead pipes in racking off wines, cider, and beer; by the use of lead-lined chambers in soda-water apparatus and the like. It is very certain that the use of leaden siphons for drawing cider and vinegar from the cask is a very common practice among farmers and dealers in the U. S.; and a dangerous, senseless, and even criminal, practice it undoubtedly is. (3) By the use of lead paints;

hence the name "painter's colic" applied to one symptom of lead-poisoning; plumbers, type-setters, and operatives in white-lead works are often its victims. *Symptoms*.—These are (1) pain, often intense, in the abdominal region, with constipation, sometimes, though rather rarely, accompanied by acute inflammatory symptoms; (2) a blue line visible on the gums near the roots of the teeth; the gums and teeth often foul and tender; the breath offensive, the mouth having a metallic taste; (3) sometimes icterus or jaundice—the skin dark rather than yellow; the patient usually looking pinched and haggard; (4) there is a certain proportion of cases which have "lead-palsy," affecting primarily the extensors of the wrist. This is the affection called "wrist-drop," though wrist-drop is sometimes seen with no other indication of lead-poisoning. Lead rheumatism sometimes occurs, and disease of the brain from lead-poisoning, while delirium, convulsions, and coma are not unknown, but these forms are rare. *Treatment*.—Opium is the sheet-anchor in ordinary lead-poisoning. It relieves the pain, and even at times the obstinate constipation of this disease. Cathartics are extremely useful, except when there is much tenderness of the bowels. In such cases their use should be deferred for a time. Iodide of potassium is prescribed in chronic cases, and is believed to assist in the elimination of the metal. Sulphuric acid and the sulphates are administered with a view to precipitating lead from the circulation.

Lep'rosy [Gr. *λεπρα*, "leprosy"], "an incurable constitutional disease of adult life, which is especially prevalent in tropical and sub-tropical climates." (*Robert Living.*) It may be divided into three forms, as follows: "*First*. Macular leprosy, characterized by an eruption on the skin, accompanied by anæsthesia. *Second*. Anæsthetic leprosy, of which the chief features are anæsthesia and discolorations of the skin and atrophy of the muscles, with ulceration and mutilation of the hands and feet. The *third* form, or tuberculated leprosy, is characterized by a bronzing and tuberculated thickening of the skin, especially of the face, ears, hands, and feet, followed by similar changes in the mucous membrane of the upper part of the alimentary and respiratory tracts, ending fatally in from two to fifteen years, by intercurrent disease in some vital organ." (*Living.*)

Leprosy, or *elephantiasis Græcorum*, is a disease which has been known and justly dreaded from the earliest ages. We find frequent mention of it in the Bible, but the disease as there spoken of evidently included many other skin affections, which at that

time they were unable to differentiate. The proof of this is that the cases are there mentioned as having recovered, which we now know would have been impossible had they been true leprosy. The leper has always been an outcast from society, both on account of the loathsomeness of his disease and the idea which has prevailed of its contagiousness. During the Middle Ages numerous leper-houses were established in various parts of Europe, where those suffering from the disease were confined, and prohibited by law from appearing in the streets. Now, however, that it is known that the disease can only be transmitted from parent to offspring, the laws are more lax on this point, and a leper-house is a thing seldom heard of. At the present time leprosy is most prevalent in Syria and Egypt, and the cases met with throughout Europe and America are rare. Almost every drug in the pharmacopœia has been used in the treatment of this disease, but without avail, and now the treatment is principally palliative. Good food, clothing, and the prevention of marriage amongst lepers are the only means we possess to better their condition and decrease their number.

Leucocythæmia [Gr. λευκός, "white," κύτος, "cell," and αίμα, "blood"], or **Leuchæmia**, a disease of the human subject, characterized by a very great excess of the white cells in the blood, and by a corresponding diminution of the proportion of red corpuscles. It is accompanied by enlargement of the spleen or of some of the lymphatic glands, or of both, and cases are reported accompanied by disease of the medullary mass in the bones, which mass takes on, or perhaps normally possesses, the lymphatic function. In some cases the white blood-cells are not to be distinguished from the normal ones; in others they are smaller and accompanied by free nuclei and granules. The liver is frequently enlarged. A hæmorrhagic diathesis is often developed. The patient wastes away and becomes anæmic. Of the causation and cure of this disease nothing is known. It is always fatal, but often chronic.

Leucorrhœa [Gr. λευκός, "white," and ῥέω, to "flow"], the "whites," a catarrhal flow from the vaginal or uterine mucous membranes. This disease is an exaggeration of the normal mucous secretion, and is often consequent upon a somewhat inflammatory condition of the mucous membranes. Rest, the use of iron and other tonics, and astringent washes are often highly beneficial. Sometimes the catamenia assume a leucorrhœal character, especially towards the close. The cervix uteri is often involved in a sub-acute or chronic inflammation, which not

unfrequently is best treated by local caustic or other applications.

Lith'ic-Ac'id Diath'esis, a name given to that condition of the general system which favors the production of lithic acid or its salts in the urine. It has been, and still is by many, regarded as a peculiar diseased state in which the acid or its salts are produced in the blood, and separated therefrom by the kidneys; but those taking an opposite view hold that the salts are formed in the urine, either in the pelvis of the kidney or the bladder, but *always* after it has been excreted; also, that the peculiar condition of the system favoring it is one of mal-assimilation. Lithic or uric acid occurs in the urine as small crystals of an amber color, varying in diameter from $\frac{1}{5000}$ th to $\frac{1}{1000}$ th of an inch; they are usually either lozenge or drum shaped. It may also exist in combination with ammonia, soda, or lime, forming the urates of those bases. The urates form the sediment generally found in the urine in nearly all acute inflammations, fevers, gout, rheumatism, diseases of the liver, etc., and they indicate a highly acid condition of the fluid, by which they are precipitated from those substances which should hold them in solution. When deposited in any part of the urinary tract they may form into gravel or stone. (See CALCULUS.) Treatment should be corrective. The aliment has not been properly assimilated; in four cases out of five abuses at the table are the source of the trouble.

Liver, Diseases of. See ASCITES, CALCULUS, COLIC, GALL-STONES, HEPATITIS, JAUNDICE.

Lock'jaw. See TETANUS.

Locomotor Ataxia. See TABES DORSALIS.

Loss of Voice. See APHONIA and THROAT, DISEASES OF.

Lumba'go [Lat.], or **Crick in the Back**, is a sub-acute rheumatism, often very severe, and seated in the lumbar region. Strong liniments, rubbing with the hand, the application of the electrical brush, and cupping are all useful.

Lung Fe'ver. See PNEUMONIA.

Lu'pus [Lat., "wolf"], a disease of the human subject, most commonly attacking the face, and beginning in nodules in the skin. Sometimes this disease is observed in syphilitic or serofulous patients, but in many cases no predisposing diathesis can be found. It usually attacks the young after puberty, and is rare after the age of forty. It is roughly divided into *lupus exedens*, or devouring lupus, and *lupus non exedens*, in which there is no ulceration; but in this last form there are sometimes neoplastic growths in the integument, which degenerate and shrink away, horribly distorting the

face. There are many minor varieties known to the surgeon. True lupus, if neglected, becomes one of the most dreadful of diseases, destroying the tissues as completely, and often far more rapidly, than cancer. Happily, it is commonly a much less painful disease, and it is so far local that if thoroughly destroyed by caustics there is room for hope of permanent recovery. If the disease should return the application of the caustic must be repeated. Cod-liver oil, iodine applications, and general tonics are often useful.

Mala'ria. See INTERMITTENT FEVER, MIASMA, REMITTENT FEVER.

Malignant Diseases. See CANCER.

Malignant Sore Throat. See DIPHTHERIA.

Malignant Pus'tule, a disease communicable from the lower animals to man (and especially from horned cattle), though sometimes, apparently, originating in man without contagion. It is apparently the same as "black quarter" in neat cattle and "murrain" in sheep. It sometimes attacks those who handle the hides, and especially the hair, of the lower animals; and is believed to be sometimes propagated by insects, which, flying from the animal which is diseased, may alight upon some abrasion or pimple on the skin of a human subject, and thus transmit the disease. In its inception it resembles a boil, or sometimes a carbuncle, seldom very painful; the pustule soon becomes the seat of gangrene, sometimes emitting a remarkable fetor; there is an intense fever, with profound septic symptoms; and unless active treatment be employed death is certain to follow; which, indeed, is often the case with the best treatment. To be effectual the treatment should be undertaken early. But, unfortunately, it is often impossible to distinguish the disease early, unless it assumes a quasi-epidemic character, as sometimes happens. The use of powerful caustics upon the pustule, with general stimulants, tonics, and concentrated food, is sometimes effectual in saving life.

Maras'mus, consumption of the bowels, abdominal phthisis, is a wasting disease of the entire body, dependent upon serofulous or tubercular degeneration of the mesenteric glands. It is chiefly a disease of children, especially the bottle-fed, those in asylums, or illy cared for. It often coexists with the presence of tubercles in the lungs or tubercular meningitis, and frequently is developed by the exhaustive influence of a difficult dentition or persistent summer diarrhoea. The prognosis is always bad. The treatment is entirely nutritive. Fresh air, the seaside, abundance of pure milk, rich diet, cod-liver oil by the mouth and by in-

unction, and tonics may save some cases. More often the emaciation is progressive, and the patient dies of exhaustion or in the coma and convulsions of associated brain trouble. The enlarged mesenteric glands can often be distinctly felt.

Marks. See BIRTH-MARKS and NÆVUS.

Mea'sles [Lat. *morbilli*], (*Rubeola*), the most frequent of the eruptive fevers. It is met with chiefly in the young (rarely in the first half year of life) and in such adults as have not contracted it in childhood. Most people are affected but once in a lifetime, but the cases of second, third, and even fourth attacks, are not uncommon. Its contagion is most effective about the time when the eruption first shows itself, but it remains active until the skin has been restored, by peeling (desquamation) and successive development, to its normal state. The eruption consists of small elevated reddish spots (like a raspberry), which merge into each other, and form discolorations of the size of a pea to that of a dime-piece, interrupted by normal white skin. In from eight to twelve days after contagion a number of premonitory symptoms develop, such as cough (loose or barking), languid eyes, nasal catarrh, headache, and fever. At the end of four days the eruption appears, first on temples, forehead, and cheeks, progresses downward a day or two, and disappears in about four days. The skin will peel off in very small scales (not in flakes as in scarlet fever), and be in a normal condition after a week. Meanwhile, the cough will become looser, the discharge from nose and bronchial tubes less, and fever subside. The large majority of cases run this mild and normal course with a very small mortality. But there are cases and epidemics accompanied with great danger in consequence of complications. The main danger lies in the accompanying inflammation of the bronchial tubes and lungs, which may prove fatal in a short time, or result in chronic inflammation and consumption. Besides these, inflammation of throat, ear (not so frequently as in scarlatina), eyes, and kidneys may remain behind. As these affections are very serious, every case, no matter how mild, ought to be seen once or twice by a physician. The usual treatment of mild cases consists in rest in bed from three to eight days, moderate darkness, and cool temperature (67-68° F.) of the room, cooling beverages. Where cough is obstinate a child of two years may take twenty-five drops of paregoric or one grain of Dover's powder at bed-time. In some cases there is a difficulty in regard to distinguishing measles from scarlet fever, especially where the former is also complicated with sore

throat of a simple or diphtheritic character. The ushering-in symptoms belonging to the *respiratory* organs, such as described above, are characteristic of measles, while scarlet-fever symptoms take hold of mouth, throat, and the digestive tubes in general.

Meningi'tis [Lat. *meninges*, "membrane," and *-itis*, an affix denoting "inflammation"], inflammation of the membranes which envelop the brain and spinal cord, termed cerebral, spinal, and cerebro-spinal meningitis according as the inflammatory process is limited to the region of the cerebrum or brain, the region of the cord, or involves the investments of both. Acute cerebral meningitis results from injuries of the head, as fractures and diseases of the cranial bones, inflammation and suppuration of the middle and internal ear, from excessive mental labor, from perverted states of the blood, as in typhus fever and acute rheumatism. Sub-acute or secondary meningitis, of less intensity, occurs in many of the febrile diseases. The tubercular meningitis of children is the result of malnutrition of the blood or of actual tubercle of the brain. Spinal meningitis most often follows injury or disease of the vertebrae, less frequently is excited by rheumatic, gouty, and tubercular blood states. It may occur, as among soldiers in the field, from exposure in sleeping on the ground. Cerebro-spinal meningitis is usually epidemic, and is but one manifestation of a malignant febrile disease, the cerebro-spinal or spotted fever. Acute meningitis is treated locally by cold applications and counter-irritants, internally by remedies reducing the action of the heart. In secondary meningitis we treat the primary disease, the exciting cause. Tubercular meningitis requires improved hygiene, diet, tonics, and alteratives. Cerebro-spinal meningitis requires nourishing diet, tonics, and stimulants to resist the degenerated blood state, and opium is pre-eminent in curative effects. (See BRAIN FEVER.)

Menta'gra. See BARBER'S ITCH.

Methomania [from the Gr. *μέθυ*, "wine," and *μανία*, "mania"], irresistible desire or morbid craving for intoxicating substances. (See DIPSO-MANIA, INEBRIETY.)

Mias'ma [Gr. *μίασμα*, "stain," from *μιαίνω*, to "contaminate"], an emanation, especially that from the earth in low marshy districts, which is capable of penetrating the human system, and producing therein certain manifestations of disease. It probably consists of cryptogamic growths, the product of vegetable fermentation. It is never generated unless the average temperature of the day is 60° F., and sometimes a much higher temperature is required, as in yellow fever, which

never occurs below 80° F. Another thing necessary for its production is moisture, hence we do not find it in dry or sandy regions. Besides these, it is essential that there should be vegetation; accordingly, we find it in the extensive marshes of warm latitudes, and not in high and cold regions. Exceptions to this rule may be found in the Dismal Swamp and in the bogs of Ireland, which do not produce it. New alluvial soils, when there is a subsoil of clay, are especially adapted to its production. Miasmatic diseases may and do occur where miasm is not produced, as it may be carried from one place to another by rivers, and it seems to be more prevalent on the eastern than on the western bank. It is also found at the mouths of rivers. The drying up of an inundation is apt to reproduce it where it has previously existed. It is formed about meadows that have been flooded for the purpose of cultivation. A wet season followed by dry weather is eminently productive of it, but a continuous wet season not so. In miasmatic regions turning up the soil will give rise to this poison in great abundance. In the excavation of the Erie Canal the fever was renewed in regions where it had ceased. Mill-ponds when low produce miasm. It can be conveyed by the wind over level surfaces for several miles.

The circumstances which are unfavorable to the production of miasm are—1st, high latitudes and altitudes. Mountain-regions are generally free from this disease. Primitive forests are little subject to miasmatic affections, but whether this is due to the shade or to absorption by the leaves is not known. Free ventilation diminishes the danger, and the more stagnant the air the more concentrated will be the poison. Obstacles may be interposed to cut off the miasm. A screen of trees will very often preserve a house from malarious influence; this is true also of hills. Inundation appears to drown it out for a time, but as soon as the water disappears it returns. Cultivation of the soil while continued will drive away the miasm. The drainage of marshes is a protective measure, although it requires some years to exhaust it. This is very strikingly illustrated in the drainage of large cities. Cold has the power of destroying it, and when miasmatic diseases occur in winter they are due to exposure during the previous season. Certain plants growing in the marshes have the power of destroying it. Night adds to the power of the poison—day dissipates it. No point in the history of miasm is probably better settled than this. It is known to be more active on the ground than on neighboring elevations, and the upper stories of a house

are safer than the lower. Many persons suffer from miasm without having fever; these persons lack mental and physical power; the countenance is pale, and the period of life is shortened. The influence of the poison may be seen even in animals which are fat enough, but certain diseases of the viscera appear when they are prepared for market. Miasmatic fevers may return any number of times. Quinine will both cure and prevent them. (See INTERMITTENT FEVER.)

Meniere's Disease. See EAR, DISEASES OF.

Milk Fever, a name applied by midwives to a short febrile attack which sometimes attends the beginning of the milk-secreting process, a few days after childbirth. It is sometimes ushered in by profound and rather alarming chills, but is unimportant except as sometimes simulating the onset of puerperal fever, for which it is occasionally mistaken. Farmers and veterinarians apply the name to puerperal peritonitis of the lower animals, and to a severe form of cerebro-spinal meningitis which sometimes attacks cows after calving. The last-mentioned disease is treated by cathartics, mercury, aconite, and heat to the spine; the former, by opium, aconite, mercury, and hot abdominal fomentations.

Milk Leg. See PHLEBITIS.

Mortification. See GANGRENE.

Mouth, Diseases of. Inflammation of the mouth is designated stomatitis. Simple stomatitis or catarrh of the mouth results from the irritation of decayed teeth, of hot or cold food or drinks, of chemical or medicinal irritants, and by using tobacco and pipes. It occurs in infants during dentition; they may cease to nurse, and the irritation of the sensitive nerves of the mouth may cause reflex spasm or convulsions. Its symptoms are a sense of burning, tenderness, tension, foul taste, the adherence of viscid mucus, and a diffuse redness. The treatment comprises the frequent cleansing of the mouth by cold water, alkaline gargles, as of carbonate of soda, and the correction of the known cause. Ulcerative stomatitis appears in points upon the tongue, the interior of the lips and cheeks, where mucous glands have been obstructed, swollen, and ulcerated, or inflamed in the courses of catarrhal stomatitis. Aphthæ, or erupous stomatitis, present small white spots with red borders, known as canker, and erroneously termed blisters or vesicles. They contain no fluid. The white spot is a fibrinous patch of inflammatory exudation upon the mucous membrane. This soon is thrown off, leaving a painful excoriation. Aphthæ occur most often among teething children who are poorly nourished. The spots may be

numerous and isolated, or coalesce in irregular patches. Their treatment is by diet, correcting indigestion, and chlorate of potash as a specific. Diphtheritic stomatitis or *cancerum oris*, sloughing inflammation of the mouth, results from salivation and from defective hygiene in asylums for orphans and foundlings or among soldiers in barracks. With modern hygiene it has become infrequently contagious or epidemic. The first appearance of diphtheritic matter should be cleared away, chlorate of potash heroically employed, the patches cauterized with nitrate of silver, and the strength vigorously sustained. Scurvy causes stomatitis of variable severity. Nursing children contract primary syphilitic ulcers of the mouth from infected mothers or wet-nurses. Muguet or thrush, erroneously termed aphthæ, is a parasitic disease. It occurs in infants during the first month of life, and in adults only preceding death by slow, exhaustive disease. In these two states the mouth is much opened to the air, which dries secretion, and mastication is slow. The parasitic plant *Oidium albicans* gains entrance and attachment. It develops at first in white frosty patches on the tongue and sides and roof of the mouth. It consists of round spores and delicate filaments. Later, the patches are thick, curd-like, and yellow, due to fatty degeneration. The deposits should be removed and the exposed surfaces kept clean and bathed with a solution of sulphite of soda.

Mumps [Dutch *mumms*]. This is one of the infectious and contagious diseases, and belongs to the same class with whooping cough, measles, scarlatina, etc. It is often met with when the two latter are prevailing. In some localities with a moist and cold climate it is very frequent (endemic). The principal sufferers are children (mostly male) of from seven to fourteen years, but adults are not exempt. Its period of preparatory development (incubation) lasts from one to three weeks; its principal symptoms are—moderate fever; pain on pressure over the region of the parotid gland, mostly of the left side (but of the opposite side also, and sometimes of both) in front of and below the ear; considerable swelling of that region and the whole cheek and chin; difficulty in deglutition and respiration, corresponding with the amount of swelling; change of the voice; fulness of the head; and dizziness. In many cases the spleen and numerous lymphatic glands are also tumefied. In men the testicles and seminal glands, in women the ovaries, may also swell, and catarrh of the mucous membranes of the eyelids, nose, and mouth is not unfrequent. The disease lasts from a few days

to a week; the swelling will subside gradually; in some cases, however, the parts remain large and hard; in a few an abscess will form. The treatment is simple. Regulate the diet, give less meat, more milk, gruel, fruit; vegetable acids (lemonade) or dilute muriatic acid (ten to fifteen drops in a tumblerful of water) as a beverage, mild purgatives (Rochelle salts, seidlitz powder, cream of tartar). The best local applications are raw cotton and cold water; warm water or poultices only when an abscess has commenced to form. No internal treatment except quinine when the fever is high, and iodide of potassium when induration remains behind. It is understood, however, that such treatment ought to be under the superintendence of a physician.

Myelitis [Gr. *μυελος*, "marrow"], inflammation of the substance of the spinal cord. At the beginning of this century nearly all affections of the spinal marrow were classified under the title *myelitis*, but some progress has been made in separating these various diseases. Our knowledge is, however, as yet very imperfect, and in the classification offered below there are doubtless some errors. Forms of myelitis may be best classified, according to the product of the inflammatory process, into softening myelitis, purulent myelitis, hyperplastic myelitis, and degenerative myelitis. (a.) The first of these forms, softening myelitis, is closely allied to non-inflammatory softening (from thrombosis, embolism, etc.), and it is probable that future researches will reduce the frequency of its recurrences. After death a small part of the spinal cord, usually a segment involving all its columns and the gray matter, is found softer than usual, or even in a semi-fluid state, reddish or reddish-yellow in color, sometimes white or yellowish. The substance of the spinal marrow is disintegrated, and a microscopic examination shows the presence of altered nerve-fibres and cells, granular bodies, fatty detritus. The symptoms during the life of the patient consist in impairment or loss of the power of motion and of sensibility in all parts of the body below the softened spot. For example, a focus of myelitis in the middle dorsal region will cause paralysis of the lower limbs (paraplegia) and of the bladder and lower bowel; a focus in the upper cervical region will produce palsy of the entire body except the diaphragm. The symptoms may be developed rapidly, with pain and spasm, loss of function being complete in a few days, or during many months the patient complains of increasing numbness, loss of sensibility and power. The prognosis is worse in proportion to the acuteness and to the higher location of the focus.

Treatment occasionally arrests the disease, but probably never cures it. (b.) Suppurative myelitis is exceedingly rare, and we do not know any symptoms which can serve to distinguish it from any acute myelitis. The purulent matter is collected in the shape of small abscesses, or purulent elements are found diffused among the nervous fibres and cells. (c.) Hyperplastic myelitis is relatively common, and is that which gives rise to the various forms of "sclerosis." The initial lesion in these cases is increased activity and volume of the neuroglia or framework of the spinal cord, with consequent wasting of the nervous anatomical elements. Later, products of degeneration appear in the shape of granular and amyloid bodies. The affected portion of the spinal cord is found hardened, like boiled white of egg or soft cartilage; it is grayish or yellowish in color, and presents a translucent instead of the normal dead-white appearance. The microscope shows increased neuroglia, disintegrating nerve-fibres and cells, granular bodies (especially around the blood-vessels), and amyloid bodies. Sclerosis of the spinal cord may be classified, according to its distribution in the organ, into (1) striped sclerosis, which may extend upward and downward in any of the columns—in the posterior columns producing the disease clinically known as locomotor ataxia; in the anterior or antero-lateral columns produce paraplegia, with loss of motion alone or chiefly; in the lateral part of the antero-lateral columns giving rise to contracture of the limbs. There may be (2) a limited sclerosis, involving the several columns and the gray matter at any part of the spinal cord, producing a chronic paraplegia; and (3) nodular (or insular) sclerosis, *sclerose en plaques*, in which the disease affects a number of spots upon or in the spinal cord (and brain), the nodules being distributed in a wholly irregular manner. The symptoms produced by nodular sclerosis are very irregular, depending upon the location of the first and of the largest nodules; there are observed loss of power and sensibility (rare) in the limbs, mental and sensorial symptoms. (d.) Degenerative myelitis includes two principal forms: (1) a parenchymatous inflammatory (?) change in nerve-fibres or ganglion-cells; and (2) the changes which occur in the spinal cord in consequence of a lesion in the brain or in the spinal cord. Under the first head are to be classed those changes in the anterior horns of the spinal cord which give rise to paralysis accompanied by wasting of the affected muscles, or to wasting of the muscles primarily; acute, sub-acute, and chronic spinal paralysis (infantile spinal paralysis, spinal paralysis with atrophy in

the adult), progressive muscular atrophy, labio-glasso-pharyngeal palsy. The lesion consists in a clouding and granular disintegration of the ganglion-cells of the anterior horns, with some as yet ill-understood change in the substance in which they are imbedded. Occasionally this lesion involves the greater part of the anterior horns in a longitudinal way, and soon leads to death by asphyxia (acute ascending palsy). In some of these forms sensibility is relatively little impaired, in others not at all. The degenerative myelitis which is caused by some other lesion of the nervous centres consists in wasting of the nerve-fibres and the deposit of numerous amyloid and granular bodies.

Myopia [Gr. *μῖα*, to "close," and *ὤψ*, the "eye"], short-sightedness, due to excessive convexity of the cornea or to convergence of the visual axes of the eyes. It is produced by excessive use and straining of the eyes, or impaired health and nervous excitability, which disorder the motor muscles of the eye, and the "accommodation" or tension of the eyeball, determining the convexity of the cornea. But the bad habit of holding books or other objects too near the eye, especially with children at school and with artisans, is the most frequent cause. It is to be remedied by disuse or rest of the eye, corrected habits, and appropriate glasses. (See SIGHT, DEFECTS OF.)

Near-Sight'edness. See MYOPIA.

Nævus, points or patches of variable size on various parts of the surface of the body, of blue or purplish venous hue. These are often congenital, and are termed birth-marks, and frequently have a fanciful resemblance to persons or objects which appeared to or alarmed the mother previous to the child's birth. Such marks often present only discoloration, due to a venous capillary network, without vessels of perceptible size. Nævi, as a rule, are perceptibly vascular and elevated; they can be emptied of their blood by pressure with the finger, and again fill when the pressure is withdrawn. Nævi are treated by puncture with the white-hot needle, by caustics, compression, electrolysis, styptic injections, and excision.

Necro'sis [Gr. *νέκρωσις*, a "killing"], the death of a large piece of bone or of a whole bone in the living subject, as distinguished from *caries*, the ulceration or molecular death of bone. Necrosis may result from injury, from periostitis, from phosphorus-poisoning, and from syphilis. It may be superficial, central, or total. Necrosis almost always calls for surgical interference for its complete cure. The dead bone finally separates as a *sequestrum* from the living bone, and until it is quite detached it is worse than useless to attempt to operate. The

sequestrum is usually enclosed in a case of new bone, which must be cut through before the removal can take place. If the patient be young and otherwise healthy, the removal of the sequestrum is usually followed by recovery. In all cases a generous diet, with appropriate tonic treatment, is called for.

Nerv'ous Diseases, affections of the nervous systems, which are either organic or functional; *i. e.* diseases produced or accompanied by an anatomical alteration which can be recognized with the naked eye or the microscope, and such as are caused by morbid states not accompanied by any such alterations. It is, however, probable that intimate chemical changes, not to be recognized with our present means of observation, occur in organs which are "functionally" diseased. The growth of physiological and psychological knowledge in the last few years has caused mental affections to be classed with nervous diseases. Besides these there are the following principal morbid states (many of which are treated of separately in this work under appropriate headings): anæmia, hyperæmia, mal-nutrition of the great nervous centres; hysteria, spinal irritation, epilepsy, chorea, neuralgia, tetanus, catalepsy; inflammations of the brain, spinal cord, and nerves (and their envelopes); tumors and injuries of the same; apoplexy. It should be borne in mind that many nervous diseases, so called, are only expressions of general pathological states or sympathetic reactions to local morbid states of non-nervous organs. It has been taught that certain nervous diseases, such as insanity, hysteria, epilepsy, etc., become more frequent with increasing civilization. This is not fully established, and yet there can be no doubt that the strains of social life, the struggle for existence, the enormous striving of ambition, the intemperate use of sensual gratifications, cause the above diseases in a more or less direct manner. Nervous diseases—or, more exactly speaking, the liability to nervous disease—are very easily transmitted from parents to their children, this being most strikingly shown in insanity, hysteria, epilepsy, neuralgia, apoplexy. An important factor in the development of nervous diseases is wrong education, the cultivation of the mental powers during the age of growth, not enough rest, and insufficient (especially fatty) food being allowed. The evil effects of school-life are seen in both sexes, though perhaps more often in the female. *Mens sana in corpore sano* is not a mere adage, but a physiological truth. (See articles on special nervous diseases, *viz.*, APOPLEXY, BRAIN FEVER, CATALEPSY, CHOREA, CONCUSSION OF THE BRAIN, CRUVEILHIER'S DISEASE, DELIRIUM TREMENS, DUCHENNE'S DIS-

EASE, EPILEPSY, FACIAL NEURALGIA, FACIAL PARALYSIS, HEMIPLEGIA, HYDROPHOBIA, HYSTERIA, INFANTILE PARALYSIS, LEAD-POISONING, MENINGITIS, METIOMANIA, MYELITIS, NEURALGIA, NEURITIS, PARALYSIS, PARALYSIS AGITANS, PARAPLEGIA, PROGRESSIVE MUSCULAR ATROPHY, ST. VITUS'S DANCE, SCRIVENER'S PALSY, SPINAL DISEASES, STUPOR, SUNSTROKE, TABES DORSALIS (locomotor ataxia), TETANUS, VERTIGO.)

Nettle-Rash, or Hives [Lat. *urticaria*], consists of elevations of the skin of the size of a pea or a bean, or larger. These elevations are usually white, or white with a red centre, or white with a red margin, or red or white with a small vesicle in the centre. The disease is of an acute character; the elevations spring up quite suddenly, and disappear after hours or days. Frequently they return; some people do not get rid of the predisposition to them for many years. The anatomical condition of the skin is that of an inflammation with effusion. The cause of this is either external or internal. External causes are contact with nettles, the influence of insects, a hot bath, the sun. In predisposed persons gentle pressure with the finger, friction, or slight irritation, suffice to produce it. Internal causes are such as irritate the nerves of the digestive organs, the genito-urinary organs, or the blood-vessels; certain articles of food, such as champagne, beer, sausage, strawberries, raspberries, currants, oysters; medicines, such as quinine or cod-liver oil. A general irritability of the nervous system may produce it. Not infrequently, therefore, it sets in with fever, sometimes with a chill, always with burning and itching. The treatment is simple, but not always efficient. Locally, the use of glycerine, cold-cream, mild solutions of carbolic acid in water. The diet must be regulated—no coffee, spice, beer, not much meat. The stomach must be improved by alterative treatment or bismuth or muriatic acid, according to circumstances. Mild purgatives will be beneficial.

Neuralgia [Gr. *νεῦρον*, "nerve," and *ἄλγος*, "pain"]. Pain in the course of a nerve is a symptom of many morbid conditions. The track and distribution of a cerebral, spinal, or visceral nerve may be the seat of the pain, which is sharp, occurs in paroxysms repeated at intervals of a few seconds or a day, the pain between the paroxysms disappearing or being replaced by soreness or dull pain. The suffering is often very intense. One curious feature of neuralgic pain is its occurrence on one side of the body only at any one time. Usually no redness or inflammation is visible in the affected region, though an exception to this

rule is observed in neuralgia of the face, during attacks of which the eye is red and lachrymose. The parts which are the seat of pain are usually over-sensitive during the paroxysms, and numb between them; there may even be loss of sensibility. Along the track of the affected nerve one or more tender points are usually found. Neuralgias are divided (1) on the basis of their distribution, (2) on the basis of their causes. The former, or topographical classification, includes the following varieties among others: facial, occipital, brachial, intercostal neuralgia, sciatica. According to the second or ætiological classification, there are—malarial, gouty, anæmic, hysterical neuralgias; neuralgias from injuries to nerves, from inflammation of nerves, and from disease of the nervous centres. Besides, in the present state of science, there are cases of neuralgia for which no cause can be made out—idiopathic neuralgia. The rational treatment of neuralgia consists in treating the pathological states which cause it. For the immediate relief of neuralgic pain the best remedies are (1) the external application of the hot-water bag, chloral-camphor, oil of peppermint, aconitic ointment, and lotions containing aconite, opium, and chloroform, and in some cases local leeching or blistering; (2) the internal administration of anodynes, as chloral, opium, belladonna. Electric currents give immediate relief in many cases.

Neuritis [Gr. *νεῦρον*, "nerve"], inflammation of nerves. Neuritis may be localized, but tends to extend above and below the starting-point; it may lead to myelitis. Peri-neuritis is that form of inflammation of nerves in which the general sheath of the nerve and the circumjacent connective tissue are the seat of trouble. The nerve appears to the naked eye larger, reddened, œdematous, and may be unnaturally fixed in its bed of connective tissue. The causes of peri-neuritis are partly unknown; cold may cause it, as well as injuries, and it is possible that the gouty disposition produces it. The symptoms of neuritis are pain, numbness, loss of function, expressed by paralysis and anæsthesia.

Nose-Bleed (technically, *Epistaxis*). It is usually due to a ruptured vessel of small size on the mucous surfaces of the nostrils. It may occur where the nostrils have been thinned or eroded by the bad habit of picking the nose, by the erosion of the surface by catarrhal ulceration, or by a determination of blood to the head, inducing rupture of a vessel. The latter occurrence is the result of a too full habit, an excited circulation as in active children, or from excitement, violent exercise, or overheating by the sun, and

of hypertrophy and dilatation of the heart. Nose-bleed also results from blows on the nose. It occurs in typhoid fever and other low diseases, where the blood is depraved. Nose-bleed is to be checked by rest on the back, cold to the nose, the use of cold water, tannin and cotton in the nostrils; when severe a physician should be called to plug the nostrils from the mouth.

Nos'trils, Diseases of. The nostrils or nares are divided into the anterior nares, which can be seen by external inspection of the openings of the nose, and the posterior nares, to be seen only by aid of small circular mirrors placed in the back of the throat to reflect light, admitted through the mouth, to the nasal cavities above. The most common of their diseases is catarrh. Nasal catarrh is produced by cold air, by insufflating dust, or by irritants. It is the beginning of many cases of laryngitis and bronchitis. It is the chief catarrhal condition in influenza, in which disease catarrh extends through the nasal ducts to the eyes, the Eustachian tubes to the ears, and into the frontal sinuses. Simple recent nasal catarrh produces a watery, alkaline serum. When more pronounced the catarrhal flow is less serous, contains mucous corpuscles, and is viscid or even tenacious—is yellowish and purulent in color. Chronic catarrh may result in constriction of the anterior nares, in the development of exuberant granulations, and polypus. In the posterior nares, by extension to the throat, it more often results in permanent or obstinate nasopharyngeal catarrh. Such chronic catarrh may give rise only to habitual coughing and hawking of mucus, but it often impairs the hearing by tumefaction at the aperture of the Eustachian ducts or by extension to the middle ear. Nasal polypus is an attached tumor in the nostrils, originally a small projecting mass of granulations or enlarged glandular tissue. When chronic nasal catarrh has resulted in ulceration and death of the cartilages or bones of the nose, the discharge is often offensive, and is known as ozæna. Close examination will discover particles of necrosed matter. Ozæna is more often the result of nasal catarrh in strumous, tubercular, and syphilitic persons. Epistaxis or NOSE-BLEED (which see) is the result of local causes, as irritating or picking the nostrils; it is a frequent occurrence in persons having disease of the mitral valve of the heart; it is a symptom peculiar to typhoid fever; it is often due to excessive exercise and to excitement. The catarrhal diseases of the nostrils are treated by topical applications, inhalations, and sprays. Ozæna demands the insufflation or injection of antiseptic washes or the surgical removal

of dead bone. Polypus is removed by cutting or tearing. Nose-bleed is checked by cold applications on the nose, by plugging the nostril with lint, or the introduction of styptics, as tannic acid, pernitrate and persulphate of iron. In extensive bleeding from the nose the nostrils have to be plugged from behind.

Obes'ity [Lat. *obesitas*; synonyms, *Poly-sarcia*, *Corpulence*], an abnormal deposit of adipose tissue under the integument and around the viscera. The amount of adipose tissue in the organism may be considerably augmented without giving rise to any inconvenience on the part of the individual in the way of encumbering his movements or interfering with the functions of the viscera, etc.; but such a condition would not come within the scope of this article. It is still a condition of health, and the term *obesity* should only be applied to those cases where the deposit of fat is so great as to incommode the patient. Of the causes of obesity we may mention, first, *hereditary susceptibility*. It is not at all uncommon to meet certain families in which most of the members are corpulent, and sometimes the tendency to become so may be traced through several successive generations. Inactivity and sedentary occupations exert a very material influence over the production of fat, especially when combined with a rich diet. In women the predisposition to corpulence exists in the first years of child-bearing, and again after the "change of life;" in men, between the ages of forty and sixty. The exciting cause is generally found to be mal-assimilation, due to some derangement of the digestive organs. We mostly find it in individuals who indulge in a rich diet, and especially if it contains fatty matters. Articles abounding in sugar and starch and alcoholic and malt liquors seem to favor the production of fat to no inconsiderable extent. The symptoms of obesity may be enumerated as follows: Diminution of mental and bodily activity, impeded action of the viscera, the organs of respiration, circulation, and digestion. The slightest exertion will bring on panting; the blood is comparatively deficient in quality and quantity, and, as a result, the muscles become weak and flabby. The countenance becomes bloated and sallow, and the patients are liable to suffer from a variety of affections which depend on mal-assimilation, as gout, rheumatism, etc. Often fatty degeneration of the heart or liver coexists, and we then have the symptoms of these maladies super-added. Mr. Harvey has shown, in his late work on corpulence, that the senses of *hearing*, *taste*, *smell*, or *sight* are often absent altogether or blunted to a very annoying

extent in corpulent persons. In the treatment of obesity alkalies internally and alkaline baths have long occupied a prominent place, and even at the present advanced stage of medical science we hear physicians daily prescribing small doses of soda, potassa, etc. with a view to procure a saponification of the fat in the interior of the body. Such a course of treatment is simply ridiculous. If a jockey wishes to "condition" a horse that has acquired too great a deposit of adipose tissue, the course he adopts is a well-known one, and is pursued also by professional pedestrians, gymnasts, etc. It consists of a regulated diet and systematic exercise in the open air. The case of corpulence treated successfully which has gained the greatest notoriety is that of Mr. Banting. He adopted a regular course of dieting, in which there was an absence of fatty, starchy, and saccharine matters. This should be rigidly adhered to, and in addition no alcoholic or malt liquors should be partaken of whatever. Both body and mind should be exercised daily.

Odontalgia. See TOOTHACHE.

Ophthalmia [Gr. *ὀφθαλμός*, "eye"], inflammation of the eye. This term, once widely comprehensive, is now usually restricted to inflammations of the membrane lining the eyelids and covering the exposed surface of the eyeball, the conjunctiva. It is divided into (1) catarrhal, (2) granular, (3) purulent.

Catarrhal Ophthalmia, or conjunctivitis, is the mildest form of inflammation of the conjunctiva. It may be caused by over-use of the eyes, by the application of the catarrhal discharges of "sore eyes," by the contact of dust, smoke, or any irritating substance, by riding in the wind, or by "catching cold." Its most common symptoms are inability to use the eyes, an itching, smarting, or burning sensation, an unpleasant dryness of the eyes, or, on the other hand, an unusual quantity of mucous secretion, causing the lids to adhere to each other. The eyeballs usually become red, and upon everting the eyelids their lining membrane is found to be still more reddened. This affection does not imperil the eyesight if properly treated.

Granular Ophthalmia, or granular lids, as it is popularly called, is a much more serious affection. It may be brought on by any of the causes which produce catarrhal ophthalmia, and is also contagious, being carried from eye to eye through the medium of towels, wash-basins, etc. It is characterized by numerous small elevations or granulations upon the conjunctiva of the lids, producing a roughness. These granulations act as a foreign body, and by rasping the sensitive

surface of the cornea during the act of winking produce a superficial inflammation of the cornea called *pannus*. The sight is then obscured, the eyes are lachrymose, painful and sensitive to light, and sometimes, resisting all treatment, go on to hopeless blindness.

Purulent Ophthalmia, or conjunctivitis, is a more dangerous disease. About 10 per cent. of the eyes affected with it are lost. It is usually produced by contagion, but may come from "a cold." It is characterized by great swelling and tenderness of the eyelids, and by a very copious discharge of a thick, purulent secretion from between the lids.

The first of these affections—viz. catarrhal ophthalmia—usually demands very little treatment beyond simple cleansing of the eyes with tepid water. Maltreatment often aggravates the affection. Every form of poultice, such as bread and water or milk, alum curds, slippery elm, etc., should be scrupulously avoided, as they weaken the inflamed membrane and convert a simple, self-limiting malady into a destructive one. The "best eye-wash" in existence is water containing in solution common table-salt in the proportion of a teaspoonful to the pint. Its effects may be indefinitely varied by changing its temperature from 32° to 100° F., and usually the patient may be allowed to choose that temperature which gives the most comfort. In granular ophthalmia long and careful treatment is required at skilful hands. In purulent ophthalmia the treatment must be prompt and vigorous from the start. In that of infants almost incessant cleansing is needed; and here the best wash is warm water, followed once or twice a day by a solution of one or two grains of nitrate of silver dissolved in an ounce of pure water, or five or ten grains of alum in the same quantity of water. Competent advice should, however, be early sought to apply more active measures in bad cases. In the purulent ophthalmia of adults, whether "Egyptian" or gonorrhœal, active treatment is needed early—leeches, ice, nitrate of silver. Where the lids are much swollen, and by their stiffness and weight prevent free cleansing or the easy escape of pus, an incision at the outer angle of the eyelids horizontally down to the temporal edge of the orbit should be early made. Such an incision "lets blood" freely, and relieves the eyeball from damaging pressure. The occurrence of catarrhal, purulent, or granular ophthalmia in a school, reformatory, or other public institution among children or adults is usually due to ignorance or carelessness on the part of some one responsible for the police of said institution, and should be subjected to rigid

inquiry and correction. Many scores of children contract eye diseases in the schools and reformatories of our large cities which ultimately result in hopeless blindness. Overcrowding and insufficient provisions for isolating initial cases are mainly to be blamed for this sad result. So great is this evil in some of the large institutions that it becomes a grave question whether it would not be well to scatter the inmates in rural families that are ready to take them, and abolish the institutions.

Otal'gia. See EAR, DISEASES OF.

Otorrh'oea. See EAR, DISEASES OF.

Ova'rian Drop'sy, accumulation of a serous and albuminoid fluid in cystic enlargements of the Graafian follicles of the ovary. The ovarian cyst may be single (unilocular) or multiple (multilocular). In some instances it exists free in the abdominal cavity; in others by pressure it has excited numerous inflammatory adhesions. The swelling appears at first on one or other side of the abdomen, but, increasing, occupies the median portion, and increases in size with the accumulation of fluid until the abdomen may equal or exceed the size of the abdomen in pregnancy, large uterine tumors, the dropsy of cirrhosis (see ASCITES), HYDATID (which see), or the cancerous fatty-waxy liver. Ovarian dropsy is to be distinguished from the above conditions.

Before the modern operation of "ovariotomy," or extirpation of the sac, the prognosis was bad. Death finally resulted from exhaustion, unless relieved in exceptional cases by tapping or accidental rupture. Ovariectomy was first performed by an American physician and surgeon, Dr. Ephraim McDowell. At first attended with great mortality, now, by the aid of improved methods and instruments, the antiseptic method, and trained nurses, the mortality is light. A great majority recover. Dr. Spencer Wells of London has performed ovariectomy nearly one thousand times. The late Dr. Atlee of Philadelphia had operated on a larger number of cases than any American surgeon. The late Dr. Peaslee of New York ranked high in number of cases and favorable results. One or more exploratory tappings are made before operating, to give relief to the patient and verify the diagnosis. Dropsy of the broad ligament in general appearance resembles ovarian dropsy, but differs as regards the quality of the contained fluid and the result of operation.

Ovariectomy. See OVARIAN DROPSY.

Oxalu'ria [Lat., "oxalic urine"], a morbid condition of the general system which favors the constant excretion of oxalic acid by the kidneys. It is also known as the

oxalic-acid diathesis. At the present time the members of the medical profession are divided in regard to their opinions on this subject, some believing in such a condition constituting in itself a disease, others regarding it merely as a result of mal-assimilation; that is, "a derangement in the act by which living bodies appropriate and transform into their own substance matters with which they may be placed in contact." (*Dunglison.*) The latter view is perhaps the correct one, for we generally find those persons who have a constant and large deposit of oxalate of lime in the urine suffering more or less from dyspepsia. They are restless and uncomfortable during the digestion and assimilation of their meals, are troubled with flatulence and eructations, and, as a rule, they are more or less hypochondriacal. The advocates of the belief that the oxalic-acid diathesis constitutes in itself a disease give the following symptoms as accompanying the excretion of oxalate of lime: Emaciation, nervousness, painful susceptibility to external impressions, and hypochondriasis. The patients are incapable of exerting themselves in the least without suffering from fatigue; they are irritable and easily excitable; and there is more or less impotence. A prominent symptom is a severe and constant pain or sense of weight across the loins. The above train of symptoms undoubtedly very frequently co-exist with the presence in the urine of oxalate of lime; the majority of them are the symptoms of dyspepsia, and may be present without the occurrence of oxalate of lime, and, conversely, oxalate of lime may be produced in immense quantities without any of these symptoms being present. Thus, we may have calculi of the salt repeatedly formed both in the pelvis of the kidney and in the bladder. We also repeatedly find oxaluria occurring in phthisis, heart disease, bronchitis, rheumatism, anæmia, cirrhosis, cancerous diseases, and even in a state of perfect health. Especially is this the case if we do not examine the urine for twenty-four hours after it has been passed, as during that time the mucus in the urine putrefies and communicates its alterations to the rest of the fluid, and lactic and oxalic acids are produced from some of the undetermined animal matters contained in the excretion. As fast as the oxalic acid is formed it unites with the lime which is in solution in the urine, and thus oxalate of lime is produced. This oxalate of lime is entirely insoluble in water and in the urine, even when heated to the boiling-point, so that it is difficult to understand how it could have been held in solution previously, and it surely could not have been excreted by the kidneys in any other condition. Oxalate of

lime occurs in the urine in the form of minute octohedral or dumb-bell-shaped crystals, varying in size from a ten-thousandth to a thousandth of an inch in diameter. The formation of oxalic acid in the blood is occasioned by the mal-assimilation of certain articles of diet, especially those containing sugar, but in exactly what manner has not yet been determined by physiologists. Hence, sugar and all saccharine matters should be avoided as much as possible. Attention should be paid to the general health, and particularly to the digestive organs. As medicines, nitro-muriatic acid, given either alone or combined with tonics, and laxatives seem to be the favorite remedies.

Ozæ'na [Gr. *ὄζανα*, from *ὄζειν*, to "have an offensive smell"], a disease of the nose, characterized by a discharge of fetid muco-purulent matter from the nostril. It may depend upon caries, and may be a symptom of cancer, syphilis, glanders, or scurvy. It often follows scarlatina, or even a severe cold. General tonic treatment, good food, and weak local disinfectants are indicated in simple ozæna; but if there be caries, or any specific disease of which it is a symptom, such a disease will require attention.

Painter's Colic. See COLIC and LEAD-POISONING.

Palpita'tion [Lat. *palpitatio*; Fr. *palpitation*; Gr. *παλμός*; Ger. *Herzklopfen*]. The heart usually performs its important work without attracting any attention, the person, to use a common phrase, "not knowing that he has a heart." The perceived and forcible beatings are called "palpitation." It may occur in a healthy as well as in a diseased heart, caused by physical exertion, mental excitement, the use of tobacco, flatulent dyspepsia, a watery state of the blood (*anæmia* or *hydrocæmia*), or a sense of palpitation may arise from increased nervous sensitiveness, without any real increase in the force of the heart-beats; while on the other hand, in enlargement of the heart the beats may be very strong, and yet not be recognized, except by an external examination. In hypertrophy and in fatty degeneration of the heart palpitation is a common occurrence, generally coming in paroxysms, lasting from a few minutes to some days, with equally varying intervals. The extract of nux vomica and the tincture of aconite are much relied on to subdue the excited heart when it is diseased, while secondary palpitation in the healthy heart is treated by removing the cause. (See HEART DISEASES.)

Pal'sy. See PARALYSIS.

Paral'ysis [Gr. *παράλινεν*, to "relax"], impairment or loss of voluntary or normal reflex motion through defective nervous excitation. This definition excludes cases in

which the voluntary power of motion is lost by reason of injuries or diseases of muscles, bones, joints, etc. Sometimes paralyzed parts are the seat of involuntary (reflex) movements, which may be very extensive and powerful. It is not proper to apply the term "paralysis" to the condition of loss of sensibility. Any part of the body containing muscular fibres, striated or unstriated, may be paralyzed. Thus, we have paralysis of the heart, of the arteries, of the bowels, of the limbs, or of the muscles of the face, the eyeball, etc. Paralysis are classified in two ways, according to their distribution, and according to the morbid conditions causing them. Under the first head there are hemiplegia (palsy of one-half of the body longitudinally), paraplegia (palsy of the legs and lower half of the body), general paralysis (palsy of the whole body), glossoplegia (palsy of the tongue), etc. Under the second head are cerebral paralysis (caused by disease of the encephalon), spinal paralysis (produced by disease of the spinal cord), peripheral paralysis (caused by disease of the nerves), functional or reflex paralysis (not caused by material disease of nervous organs), and toxæmic paralysis (induced by the presence of a poison in the blood). (See HEMIPLEGIA, INFANTILE PARALYSIS, PARALYSIS AGITANS, PARAPLEGIA, PROGRESSIVE MUSCULAR ATROPHY, SCRIVENER'S PALSY.)

Paral'ysis Ag'itans, or senile palsy, an involuntary tremor of the whole body, or exceptionally of a part, due to old age, to privation and exposure to cold, and also to the enervating influence of alcoholic abuse, opium, tobacco, coffee, tea. There is no true paralysis or loss of motor power, but continuous tremor, due to malnutrition of the nervous centres. It need not shorten life. It is amenable to rest, warm clothing, good diet, and tonics.

Paraple'gia [Gr. *παραπλῆσσειν*, to "strike beside"] paralysis of the lower limbs and (usually) of the lower part of the trunk, including the bowels and bladder. There may be anæsthesia (loss of sensibility) or dysæsthesiæ (morbid sensations) in the same parts. Although the limbs are not under the control of the will, they are often the seat of strong movements of an involuntary or reflex character. The cause of paraplegia nearly always is a disease in or about the spinal cord, in any part below the medulla oblongata; usually, the lesion is in the dorsal or lumbar part of the organ. (See MYELITIS.) The same symptoms may appear, without gross disease of the spinal cord, in consequence of irritation in some external part, of the action of cold upon the body, disease of the bowels, etc.

Pericardi'tis. See HEART DISEASES.

Peritone'um. See PERITONITIS.

Periton'i'tis [Gr. *περιτρίβειν*, to "stretch over"], inflammation of the peritoneum, a serous membrane investing the viscera of the abdomen; popularly designated "inflammation of the bowels." The peritoneum has two layers, and constitutes a closed sac; the external layer lines the abdominal walls; the internal is reflected over the stomach and intestines, liver, spleen, ovaries, uterus, and bladder. These opposed surfaces are smooth and lubricated by secreted serum, permitting the free movements of the viscera, their ascent and descent in respiration, and the peristaltic movements of the bowels. Traumatic peritonitis is the result of bruises, wounds, and surgical operations. Idiopathic peritonitis is a primary inflammation; it may result from perverted conditions of the blood or from checked perspiration and chilling of the abdomen or lower extremities. Local peritonitis is a frequent occurrence, the inflammatory process being limited to the peritoneal investment of a single viscus, as the liver, uterus, or ovary. Puerperal peritonitis, or metro-peritonitis, is inflammation of the uterus and peritoneum occurring in women following confinement. (See PUERPERAL FEVER.) Tubercular peritonitis is chronic and slowly progressive, consisting in the deposition of successive strata of inflammatory lymph, alternating with miliary tubercles, with interspersed masses of caseous matter, or yellow tubercle; tubercle usually coexists in the lungs and other organs. Acute peritonitis, as a rule, is of sudden onset. Abdominal pain is its prominent symptom, at first localized, but quickly diffused over the entire abdomen. The pain is increased by pressure, by the movements of respiration, and by tension of the abdominal muscles. The breathing is therefore chiefly thoracic, the diaphragm fixed to prevent abdominal movement, and the respiration is correspondingly shallow, restrained, and rapid. The limbs are retracted upon the body to relax tension of the abdominal surface. There is temporary paralysis of the muscular coat of the bowel; constipation results, also extreme flatulent distension of the intestines, and general tumefaction of the abdomen, which, when percussed, is resonant—a condition termed tympanitis. The inflamed surface is so extensive, invests so many important organs, producing extensive peripheral nerve-irritation as well as impressions on the plexuses of the sympathetic nerve, that the constitutional depression is very marked. The face is pale, haggard, and anxious, wearing an expression of great suffering. The teeth are set, the lips tightly drawn, the eye set and

sunken, the cheeks collapsed—in extreme cases constituting the *Hippocratic facies*, or *facies griffé* of the French. Peritonitis is always a dangerous disease, but its termination will depend upon early diagnosis and a correct treatment, conducted with vigor and persistence. When incipient, it may be aborted or limited by local use of ice or cold water, local dry cupping, cardiac sedatives, as veratrum and digitalis, and a single prompt saline purge. If fully developed, opium is the supreme remedy, to allay pain and secure absolute rest of the intestines from their physiological peristaltic action. In peritonitis the tolerance of opium is very great. The cold water or ice-pack, if judiciously used, will be of value during the acute period of the disease, but later warm and anodyne applications are preferable. The diet during the disease should be liquid, and cathartics should be avoided.

Phlebi'tis [Gr. *φλέψ*, *φλεβός*, "vein," and *-itis*, affix denoting inflammation], inflammation of the coats of a vein or veins. Phlebitis may occur in any part of the body from direct injury and accidental or surgical wounds. Idiopathic or primary phlebitis occurs chiefly in the lower extremities, especially in the tortuous expansions and dilated pouches of varicose veins. When a vein is inflamed its contained blood coagulates, adheres to the walls of the vessel; a local fibrinous mass (thrombus) obstructs or wholly suspends the circulation. Exceptionally, this thrombus organizes, connecting with the nutritive capillaries of the venous coats. More often it partly or wholly breaks down, disseminating pus and contaminating the blood, or giving off particles which are carried by the blood to the different parts of the body, and may lodge in the small vessels of large organs, occluding them. Such plugs or emboli deprive a tract of tissue of its nutritive blood-supply, and lead to the condition of fatty degeneration or abscess. Phlebitis, if acute, may be announced by chills and febrile disturbance preceding the local inflammation. The affected vessels are hard, tortuous, prominent, visibly elevated if the surface be viewed in profile. There is a dusky redness over and in the immediate vicinity of the vein, with slight tumefaction and redness of an erysipelatous character, shading off into adjacent tissues. Nodular prominences exist at the site of the valves in the veins. The vein is sensitive to touch, and the entire part tender and painful if moved. Cedema or dropsical swelling, evidenced by pitting upon pressure, may result from the obstructed circulation; in the extremities this swelling may be considerable, with sense of great weight, due to accumulated venous blood

and serous transudation. Following childbirth, phlebitis occasionally occurs, usually in the lower extremities, due to local thrombi following the perverted blood of the puerperal state, and probably resulting from absorption of septic matter by the open uterine sinuses. This painful condition is known as *phlegmasia alba dolens*, and popularly termed "milk leg." Indeed, at present the infection of the blood by septic matter and local thrombosis as the causes producing phlebitis is generally conceded. Phlebitis and venous thrombosis are chiefly interesting as endangering embolism in other parts of the body, metastatic abscesses. The "multiple abscesses" of the liver follow inflammation of the *venæ portæ*. Coexisting abscesses in the brain, lung, liver, spleen, and kidneys may develop from a general poison of the blood. When a vein is enlarged and rigid, as in the sinuses of the cranium, the veins of old hæmorrhoids, or stricture of the rectum, or the varicose veins of the leg, its inflammation is very liable to infect the system. The treatment of phlebitis will be by local antiphlogistics and internal administration of antiseptics and tonics.

Phlegma'sia (synonyms, *Phlegmon*, *Phlegmonous Inflammation*, *Pseudo-erysipelas*, *Diffuse Abscess*), an acute inflammation of the subcutaneous cellular tissue, tending to suppuration, in which the pus formed has a tendency to become infiltrated through the tissues, instead of collecting into one place, as in ordinary acute abscess. The causes of this variety of inflammation are sometimes very obscure. It has often been ascribed to infection or an ordinary cold, but these causes are in all probability only hypothetical. We do find it resulting from mortifying shreds of tissue in wounds and complicating injuries, but in by far the greater number of cases it arises spontaneously in debilitated individuals—persons suffering from mal-assimilation, and who have consequently a thin and impoverished blood, which is incapable of producing a healthy inflammatory action. In such individuals we generally find it occurring in the extremities, especially in the fingers and hand. The symptoms of phlegmasia are those of ordinary inflammation somewhat aggravated—viz. pain, heat, redness, and swelling; there is always more or less œdema of the affected part, and, as a consequence of it and the swelling, we have a tense, shining skin; a throbbing, synchronous with the pulse-beats, is one of the chief symptoms of the disease, and generally immediately precedes the suppurative process. In a few days the skin becomes red at one or more points, and fluctuation appears. Some-

times the œdema and swelling exist to such a marked extent that the skin is deprived of blood, and consequently becomes gangrenous; and as a complication we often have immense sloughs of integument coming away, exposing the uncovered muscles and fasciæ beneath. Accompanying these local symptoms there is always a high fever. In the treatment the first indication should be to remedy as far as possible the condition of the system which has acted as a predisposing cause of the trouble; for this purpose aperients and such tonics as quinine and iron should be given. Locally, suppuration should be hastened by warm applications, and as soon as fluctuation appears at any point an exit should be made for the pus by the lancet; should two or more outlets be found to communicate subcutaneously, the sinus or sinuses should be laid open the entire length, and be allowed to heal from the bottom. Sometimes local depletion, if practised at the outset of the disease, will cut it short.

Phosphat'ic Diath'esis, a name given by some physicians to a condition of the general system in which the salts of phosphoric acid are found in abnormal abundance in the urine. These salts occur normally in the proportion of 12½ parts in 1000, in the form of the phosphates of soda, potassa, magnesia, and lime; but, unless they are present in superabundance, the urine is capable of holding them in solution when acid. However, when the proportion is abnormal, although held in solution in acid urine at the temperature of the body, they are precipitated when the temperature is raised to the boiling-point, and show themselves throughout the liquid either as granular or crystallized phosphate of lime or crystals of phosphate of ammonia and magnesia. We may even find them in perfectly healthy urine after decomposition has set in. As soon as the excretion becomes alkaline from this cause, the granular phosphate of lime, being only soluble in acid fluids, is precipitated. The next change produced by decomposition is by the action of the carbonate of ammonia on the phosphates of soda and magnesia, giving rise to the phosphates of magnesia and ammonia and of soda and ammonia. Under certain circumstances the urea of the urine is altered in the kidneys or bladder; carbonate of ammonia is formed, which unites with the phosphate of magnesia and gives rise to the triple phosphate. The tendency to the formation of this salt is very often accompanied by some disease in the urinary passages, most commonly inflammation of the bladder. Independently of this, we generally find the deposit in the

urine of persons suffering from general debility; also in those who have overworked themselves or have been depressed by over-anxiety, insufficient nourishment, or sexual excesses. In them the complexion is sallow and the circulation poor. They generally suffer from cold hands and feet. The treatment for this condition should be strict attention to the mode of life of the patient, which will generally need correction. A generous diet, plenty of exercise in the open air, cold bathing, and tonics will do a great deal in a short time. If indicated, opium may be given to relieve the anxiety.

Phthi'sis. See CONSUMPTION.

Piles, or Hæmorrhoids [Gr. *αιμα*, "blood," and *πέειν*, to "flow"], vascular and fibro-vascular tumors of the lower bowel or rectum—termed *external* piles when below the sphincter muscle and upon the verge of the anus; *internal* piles when above the sphincter. In structure they are due to congestion of the hæmorrhoidal veins, which are a part of the portal venous circulation, returning blood from the intestines through the portal vein and liver to the vena cava and the heart. Piles when chronic are varicose veins of the anus and rectum, with fibrous thickening of the tissues and mucous membrane investing them. Piles seldom afflict persons who are robust, abstemious, frugal, and engaged in active exercise. They result from excessive eating and drinking, congestion of the liver, alcoholic excesses, and constipation and costiveness. Sedentary occupation favors their development. Cavalry officers and railway travellers suffer from piles—in part from constipation, in part from the influence of incessant jarring and hypostatic congestion of the lower bowel. The abuse of harsh and powerful cathartics, drinking water impregnated with mineral substances, and too fine, non-laxative diet may develop piles. Pregnant women have piles from pressure of the gravid uterus upon the veins. Piles are often the result of overheated blood and plethora, and hence are a frequent disease in tropical countries and very hot seasons. Internal piles may increase in size, and in efforts of evacuation be protruded from the bowel. By this stretching the hæmorrhoidal tumors in time become pedunculated, and are forced out with every act of defecation. They require to be constantly returned: failure to do this may result in their strangulation, ulceration, bleeding, and even removal by gangrene. External piles when inflamed may also ulcerate and bleed. Hæmorrhoids when inflamed render evacuations of the bowels very painful, and cause suffering in sitting and walking. Patients with hæmorrhoids usually discharge mucus from

the anus, and sometimes shreds and patches of organized lymph. They are to be prevented, and also treated in their milder forms and stages, by regulated, laxative diet, active exercise, and mild saline cathartics. When pedunculated they may be removed by the knife, ligature, or galvanocautery. When piles are strangulated they must be reduced in size by ice or cold water, oiled, and returned. Ulcerated and inflamed piles are treated by cold applications, astringent and anodyne ointments, and free evacuation of watery stools by use of saline cathartics.

Pin-worm (*Oxyuris vermicularis*), a parasitic worm, white, filamentous, from one-eighth to one-half of an inch long, accumulating in infants or children in considerable number in the rectum, and causing, especially during rest, a burning and itching sensation in the mucous membrane of the anus. The disease is generally temporary, and disappears spontaneously. (For treatment see ANTHELMINTICS and VERMIFUGES.)

Pleur'isy [Gr. *πλευρά*, "the side"], an inflammation of the pleura, the closed serous sac which invests the lung, separates it from the bony wall of the chest, and enables it to move freely with the alternating expansions and contractions of respiration. The causes of pleurisy are exposure to damp and cold, congestion in the course of acute febrile diseases, and extension of inflammation from the lung when the seat of pneumonia or superficial tuberculosis. Local pleurisy over a mass of tubercle in the lung-surface is a conservative process, since by pleuritic thickening and adhesions perforation of the pleura and collapse of the lung are prevented. The pleura is, in health, bathed by a slight secretion of clear serum, which lubricates the opposed surfaces and favors ease and freedom of lung-movement. An evanescent and slight attack of pleurisy, consisting in a temporary suppression of this normal secretion and a dry congested state of the opposed pleural walls, is of frequent occurrence: it will be indicated by a slight stitch and soreness over one side of the chest, a slight, dry cough, and slight febrile disturbance, quickly dissipated by rest, warm clothing, hot drinks, and evacuation of the bowels—agencies which establish the equilibrium of the circulation. Acute pleurisy is announced by an initial chill, by marked elevation of temperature, frequent pulse, rapid, shallow, and checked breathing, each inspiratory act producing a lancinating or stabbing pain in the side of the chest, the result of attrition of the dry, swollen, and sensitive inflamed surfaces. There is a dry, irritative, hacking cough, without expectoration, the effort of

coughing producing the local pain or "stitch" in the side in its greatest intensity. Soon the distended blood-vessels of the pleura are relieved by the escape of the serous or watery element of the blood, transuding their coats into the cavity of the pleural sac. This "effusion" may be abundant and consist of pure serum, filling the entire cavity and compressing the lung. In other cases it is sero-plastic, leaving an element of plastic matter or products of rapid cell-formation on the inflamed surfaces. Still other cases have only plastic exudation, agglutinating the two pleural surfaces, and liable to organize and form permanent adhesions, which bind down and cripple the lung and render it liable to certain forms of phthisis. When effusion or exudation takes place the pleuritic stitch ceases. But the presence of fluid in the pleura causes shortness of breath, disturbed circulation, and impaired health. In vigorous constitutions the fluid is soon removed by absorption, but in the feeble and sickly it remains and becomes purulent. Acute pleurisy is treated by antiphlogistic measures, anodynes to relieve pain, counter-irritants, and rich diet, tonics, iodide of potassium, during the convalescence to ensure the absorption of the effusion. When the fluid is purulent it has to be evacuated by puncture with the trochar and canula, or more safely by the aspirator, a force-pump withdrawing fluids through tubes of small calibre. When pleurisy has left adhesions, counter-irritation by iodine, comp. iodine ointment, etc., must be resorted to, and the lungs systematically and persistently inflated to prevent compression by the organizing deposit on their surface. When such deposits and adhesions are established, they are liable to increase by fresh congestive or inflammatory attacks from time to time—a condition of chronic pleurisy. Chronic pleurisy causes persistent cough, congestion of adjacent lung-substance, spitting of blood, and various steps of fibrous or interstitial phthisis, or the development of specific tubercle when the person has the inherited specific taint. Pleurisy in a majority of cases is harmless and recovered from; in the feeble, scrofulous, and consumptive, and in cases of unusual severity, it is fatal by exhaustion or the subsequent development of consumption.

Pleuro-Pneumo'nia (see PLEURISY and PNEUMONIA). In seasons of unusual severity, of great cold and high winds, when influenza prevails in epidemics and fevers tend to the malignant and asthenic forms, acute pneumonia with coexisting pleurisy, attacking one or both lungs, seems to arise from general atmospheric causes, which depress the individual vitality, and to share in the

low type and unusual fatality of other prevailing diseases. The aged, feeble, and consumptive are most in danger. The symptoms and physical signs of pleurisy and pneumonia may be clearly present, but often are vague, and marked by the extreme prostration and other features resembling typhoid or typhus. Pleuro-pneumonia of widespread prevalence and fatality occasionally occurs among domestic animals.

Pneumo'nia [Gr. *πνεύμων*; pl. *πνεύμονες*, "the lungs"], inflammation of the lung, of the lining of the air-sacs, and of the interstitial framework of the lung. Pneumonia more recently has been classified into (1) catarrhal pneumonia, when only the air-sacs are involved, filled with products of catarrhal inflammation, extending from the bronchial tubes; (2) croupous pneumonia, where the air-sacs are filled with solid lymph exuded from their inflamed walls; (3) interstitial pneumonia, a slow and chronic inflammatory infiltration and consolidation of the fibrous structures which surround the air-sacs and minute bronchial tubes. But pneumonia, as commonly termed in England and this country, consists of the croupous form only, an inflammation of the air-sacs, which are the functional elements of the lung for the oxygenation of the blood and the liberation of carbonic acid gas. Pneumonia is usually confined to one lung, rarely is double. It is further designated as "vesicular pneumonia," as the air-sacs or vesicles are involved, and as "lobar pneumonia," one lobe only frequently inflamed, or the disease attacking the lobes successively. Primary pneumonia in healthy persons occurs more often in the right lung, beginning, as a rule, at the base of the lung, and progressing upward toward the apex. In old and feeble persons it may begin at the apex, but pneumonia when local or commencing at the apex is usually secondary to tubercle in the lung, deposits by broncho-pneumonia, or former plastic pleurisy. Pneumonia is a disease chiefly of adults, and more often of males. It results from catching cold, fatigue, impoverished condition of the blood, the congestions and perverted blood-states of acute and malignant febrile diseases. It is announced by a heavy chill, high fever, rapid respiration, frequent pulse, flushed cheek—on the side of the affected lung; in severe cases by delirium and symptoms of a typhoid nature. There is acute pain in the side, due to congestion of the pleura, and a duller, heavier pain or soreness of the side, with sense of weight, due to excess of blood and the solid products of inflammation in the lung. There is cough, with expectoration of mucus tinged with blood or rust-colored; and in grave

cases brownish or dark sputa, resembling tobacco-juice or prune-juice, and indicative of a decomposed state of the blood, and the exuded elements filling the vesicles. The contents of the vesicles are gradually softened and expectorated, and the lung restored to its normal state. Acute pneumonia of adults, although grave in its symptoms, is usually recovered from, and, contrary to popular apprehension, seldom leads to subsequent consumption. Pneumonia, so called, in children is usually acute catarrhal inflammation of the minute bronchial tubes and air-sacs, occurring in one or many lobules of both lungs. It is liable to leave portions of lung-substance inactive, collapsed, or consolidated, and develop the catarrhal form of phthisis. Pneumonia is variously treated with tartar emetic and calomel, and locally cold water and ice-bags may abort or limit the inflammation. Warm applications, as poultices, warm anodyne fomentations, cotton batting, and oil silk afford the greatest comfort and favor resolution and removal of the exudation from the air-sacs. Carbonate and muriate of ammonia as diffusive stimulants and to liquefy the exuded lymph, calisaya bark or quinine, mild alcoholic stimulation, and rich liquid diet to sustain strength, veratrum viride to control the heart and lessen pulmonary congestion, are the most approved and successful agents.

Poi'son. See TOXICOLOGY and LEAD-POISONING.

Poi'son of Ser'pents. The venom of serpents is formed in a gland which lies back of and below the eye on each side, and the gland of either side discharges its poison through a duct which leads to the base of the hollow fang. The poison is in all serpents a thin yellow fluid, which is made up chiefly of albuminoid matters in solution, and resembles white of egg. One of these albumen compounds is the poison, the others are inert. The poison is active—half a drop of rattlesnake venom will kill a pigeon—and when dried it preserves its virulence for years; neither is it altered by contact with weak acids, strong alkalies, alcohol, iodine, bromine, or any disinfectant like chlorine or carbolic acid. The recent researches of Indian surgeons corroborate the prediction made years ago by Dr. Weir Mitchell in America, that the action of all the various snake-venoms would be found in time to be alike. In fact, they differ only in that some produce more local effects, and some destroy sooner than others the coagulability of the blood.

The effects are divisible into local and general, immediate and remote. The venom having been injected under the skin by the fang, the first effect is a general feebleness,

in which the heart shares, and which is or is not accompanied by nausea and vomiting. If the dose be large, the animal or man dies within a time which varies from twenty minutes to hours; but if, in man, he survives several days, the tendency is to recovery. The first effects are upon the nerve-centres of breathing, and of the heart and muscles in general. If the early depression passes over, recovery is often sudden, or else the creature poisoned enters the second stage of the poisoning. This is characterized by blood-changes and by a general degradation in the nutrition of every tissue, so that all suffer more or less. The series of changes begins with lessened or lost power of the blood to clot; at the same time the texture of the smaller vessels is so altered as to allow of the escape of the incoagulable blood, which, if the animal survive long, finds its way into the tissue of nearly every organ, causing thus symptoms which vary as the organ most affected is the brain, spinal cord, liver, lungs, or kidneys. These changes result, therefore, in bleeding from the mucous surfaces of the breathing or digestive organs, and in oppressed respiration, bloody stools or bloody urine, and finally in coma or convulsions, which close the scene. These facts account for the variety of descriptions given by authors of the causes of death in snake-bite. The local symptoms vary with the snake, but vary in degree only. First, there is thrown out about the fang-track a vast amount of blood, which, as it cannot clot, soaks through the tissues, and even stains the bones. The muscles near by soften, and at last inflammation comes on, with great swelling and pain, and with, at last, more or less local death of the part.

Snake-venom does not affect plants. Seeds will germinate in it, and it does not check the growth of the yeast-plant or inhibit the development of bacteria or vibriones; but to all life above these it is fatal when inoculated in sufficient amount, while it does not seem to have any power to injure when swallowed; so that the author has even fed pigeons on it, giving 20 or 30 drops a day for a week without harming them. Mixture with gastric juice alone does not destroy its power, but it is altered below the stomach, and seems unable to enter the blood in a virulent form by this channel. Birds die easily from venom—cold-blooded creatures slowly, unless kept very warm.

There is no antidote yet known. The proper treatment is to tie a ligature around the part bitten, and at once to lay open the wound in the line of the fang-mark. It is useless to apply any local dressing, save to put the part in hot water to provoke copious bleeding. If within reach of full help, an

elastic bandage should be put around the whole limb, after Esmarch's plan for bloodless operations, until time is given to deal with the part bitten. This would be better than a mere ligature alone, which causes swelling beyond it. After ligation every effort should be made to squeeze out the venom from the wound. Next, alcohol should be given until the heart is excited, when the ligatures may be loosened a little, so as to admit to the general circulation some of the poison, which soon or late must reach it. When the heart begins to fail the ligature should be tightened again and more stimulus given, and so the poison which remains may be fought in detail. The alcohol is not an antidote. Men bitten when dead drunk die; it is a stimulus to carry the suddenly-enfeebled system over this time of weakness. For the second stage there is little to do but to ease pain and wait.

Polypus, a tumor of any mucous cavity, as the external auditory canal, nostrils, throat, urethra, or uterus. A polypus by growth in size and weight drags on its neck or attachment, which is termed its pedicle. It may reach great size and protrude from its cavity or passage. Excision is the common treatment. (See EAR DISEASES, NOSTRILS, DISEASES OF, TUMOR, and UTERINE DISEASES.)

Polyuria, a disease characterized by excessive excretion of urine, consisting chiefly of water. (See DIABETES.)

Prickly Heat, a popular name for eruptive skin diseases, occurring in hot weather and characterized by itching and sensations of stinging. In India there is quite a formidable variety of lichen called by this name. A popular remedy is the use of saline cathartics, which doubtless are sometimes advantageous. Frequent bathing and the avoidance of exposure to the sun's rays are recommended.

Progressive Muscular Atrophy, or erceppling palsy—Cruveilhier's disease, so named from the great anatomist—a disease occurring mostly in artisans, as gold-beaters and mechanicians, who by striking or other incessant action transmit a shock to the nerves of the arm and to the spinal cord. The anterior or motor roots of the spinal nerves degenerate, and the museles of the hand, arm, and trunk progressively are paralyzed and wasted. Exposure to wet and cold may cause the disease.

Prolapsus Uteri, falling of the womb or uterus, its descent below its normal position in the pelvis; in extreme cases a protrusion of part or the whole of the organ from the body. Enlargement of the uterus by inflammation, uterine and abdominal tumors, relaxation of the tissues which are the anatomical supports of the organ, rupture of

the perineum by instrumental delivery, sudden violence in falling or jumping, are the chief causes of prolapsus.

Puerperal Fever, a fever occurring only to women, following childbirth, and characterized by acute metro-peritonitis, or inflammation of the uterus and peritoneum. It may occur in isolated cases in private practice, but more commonly develops in hospitals and lying-in asylums, where numerous patients are aggregated, the air vitiated, and especially if unfavorable surgical cases—erysipelas, gangrene, suppurating wounds, pyæmia, or septicæmia—are present. Under such circumstances many cases coexist or occur consecutively, and often spread to individuals in the surrounding community. Such epidemics, and its spread by seeming contagion, have led some to regard it as a specific and contagious disease. But a counter-opinion has greater weight of authority, that it is indeed only a condition of blood-poisoning by the absorption of septic or purulent matter on the recently-exposed and often lacerated interior of the uterus, or the inflammation of that organ and the peritoneum by the presence of septic matter in the blood. Sudden suppression of the discharge following labor, sewer-gas, emanations from decomposing animal or vegetable matter, are causes of puerperal fever. Puerperal fever is chiefly characterized by the symptoms of peritonitis—swelling, tympanitis, tenderness and pain in the abdomen, constipation, nausea and vomiting, marked elevation of temperature, and rapid, feeble pulse; the exhaustion varies with the case; the patient may die early of collapse or following typhoid symptoms of several days' duration. The treatment comprises veratrum viride to control the circulation, opium as a specific in peritonitis, and antiphlogistic local applications to the abdomen. Cold cloths or ice, sedulously employed at the outset, may abort the inflammation or lessen its severity, but when the disease is established warm anodyne fomentations are preferable. Nutritious liquid food, quinine, and alcoholic stimulus must be administered at regular intervals and in doses determined by the degree of prostration.

Puerperal Mania, perversion of the mind in women immediately after childbirth and during the first week thereafter, exceptionally occurring before delivery, or developed weeks or months after labor by excessive and exhaustive nursing. It may therefore be considered as a derangement of the mind due to the influences of the childbirth upon the sympathetic nervous system and emotional nature of the mother. Puerperal mania may be characterized by mental agi-

tation or excitability, or, reversely, the patient may sink into a state of mental apathy, moodiness, reticence, or despondency. There will be restlessness, inability to sleep, headache, impaired appetite, coated tongue—in some cases an increase of temperature. The bowels are usually constipated, the urine diminished in quantity. The secretion of milk is often lessened or suspended. Although the delirium in some cases is violent, no evidence of inflammation or other organic disease of the brain or its membranes has been detected as the lesions to which the symptoms would lead on post-mortem examination. In the delirious form and in the melancholic form there is equally an aversion to the father or the child. Suicide and murder of the child are occasional occurrences. Puerperal mania may be expected to occur in women of nervous temperament or those predisposed to insanity; in such also as are greatly reduced by previous ill-health, by hæmorrhage during or following delivery, or whose blood has been impoverished by absorption of malaria and putrescent effluvia. The prognosis is favorable; the mind in most cases is, in time, restored to a normal condition. The patient of puerperal mania may wholly escape it at subsequent childbirths if the system be fortified in advance by iron to correct anæmia, and care be taken to prevent unusual loss of blood during parturition. Where insanity or emotional excitability is a family trait, mania may recur with successive labors despite all precautionary efforts. The treatment varies with the form of mania and severity of symptoms. The infant in most cases is to be removed, as it is unsupplied by the mother's breast-milk, and its influence is often pernicious; when left, it should have a constant attendant to guard it against injury at the hands of its mother. Firm but gentle control of the patient is essential, and often removal from husband, family, and familiar friends is essential to the quiescence of mind and body. Rest and sleep must be ensured by cerebral sedatives and soporifics, as bromide of potash, hydrate of chloral, hyoseyamus, or the preparations of opium when borne without excitement, as codeine and the deodorated tincture of opium. Even the hypodermic injection of morphine may be required in obstinate insomnia and delirium. The constipation is to be corrected, the diet must be nutritious, and the appetite, if deficient, stimulated by use of tonic elixirs and wine. The strength must be sustained and the blood enriched by cod-liver oil, quinine, and iron.

Pus'tule, Malignant. See MALIGNANT PUSTULE.

Pu'trid Sore Throat. See DIPHTHERIA.

Pyæ'mia [Gr. πύον, "pus," and αἷμα, "blood"], a very fatal disease which occurs during the progress of suppuration in some part of the body, and believed to be due to the entrance of purulent matters into the blood. As it is most frequently met with in hospitals where there are many wounded persons, some surgeons regard the exciting cause in these cases to be a miasm which arises from unhealthy wounds and poisons healthy wounds. This disease is ushered in with a chill, followed by a febrile, and then by a sweating, stage. The chills are often repeated and at irregular periods, sometimes as many as three occurring in a day. Toward the termination of the case they are less frequent. Though the surface feels cold during the chill, the temperature of the body rises, and in the hot stage may reach 105° to 108° F. There are loss of appetite, thirst, want of sleep, emaciation, sallow skin, and prostration. Acute cases run a course of from six to ten days, and chronic cases from three to four weeks. Death results from exhaustion, due to the poisoning of the blood; secondary inflammations, as pleurisy; and the formation of abscesses in internal organs, as the lungs, liver, and spleen, or in the joints and cellular tissue.

Pyro'sis [from πύρωσις, a "burning"]. This name is applied to an affection of the stomach characterized by the regurgitation of a considerable quantity of liquid when the stomach is empty of food. The liquid expelled may be insipid to the taste or saltish, and it is sometimes acid. It is not vomited, but regurgitated, and the regurgitation is not accompanied by the sense of nausea which usually attends acts of vomiting. The popular name for the affection is water-brash. The regurgitation takes place especially in the morning, before food has been taken. A sensation of burning is generally felt in the region of the stomach, and frequently in the throat during and after the passage of the liquid. This burning sensation is implied in the name *pyrosis*. The regurgitations in pyrosis are to be distinguished from those which are incident to indigestion. The latter consist of food or drink which has been taken into the stomach, and which excites irritation in consequence of the chemical changes arising from defective digestion; whereas the liquid regurgitated in pyrosis is the morbid product of secretion from the glands of the stomach. Pyrosis may be associated with indigestion or dyspepsia, but not infrequently the digestive processes are but little or not at all disturbed. The affection occurs oftener in women than in men. It is an affection of middle or advanced life, being of extreme infrequency in young persons.

It is of more frequent occurrence in some countries than in others. It is said to be a frequent malady in Scotland and Ireland. It has been attributed to the use of oatmeal largely as an article of diet. Persons living on a poor, insufficient diet are more likely to suffer from it than those who live well or generously. It is not a grave affection, nor does it denote a tendency to any important disease in the stomach or elsewhere. It is generally controlled very speedily by the carbonate or subnitrate of bismuth in doses of from 20 to 30 grains, given twice or thrice daily. The treatment, in other respects, embraces the use of tonic remedies, nutritious alimentation, and hygienic influences. (See INDIGESTION.)

Quin'sy, acute suppurative tonsilitis, or inflammation of the tonsil, terminating in abscess. The term "quinsy" is a popular perversion of Lat. *cynanche*, the technical designation of a sore throat. It attacks adults, less often children; the two extremes of life, infancy and old age, being quite exempt from it. One attack usually leaves subacute or chronic disease of the tonsil, which predisposes the person to repeated attacks in subsequent seasons. Quinsy is most often unilateral, less frequently attacking the two tonsils successively, and rarely coincident upon both sides. It occurs in persons of full habit, often the plethoric, and especially when the diet has been excessive and luxurious. With such predisposing conditions must be superadded, as an immediate or exciting cause, some exposure of the body to wet or cold. Quinsy may follow checked perspiration, chilling the extremities, or wet feet. The attack is manifested by soreness of the throat, increased by swallowing and talking, soon actual pain, rigidity of the jaw, hypersecretion of saliva, coated tongue, labored breathing, and sense of obstruction, tension, and tumefaction in the throat. With the first development of pus, intense throbbing pain exists. The disturbance of the general system is variable. In mild cases only impaired appetite and sense of lassitude exist; in graver attacks there may be a slight or marked chill at the onset, and a succession of light chills; the temperature elevated to 102° or 104° F.; the pulse full and bounding; the mind delirious at night, and by day the face expressive of great fatigue from loss of sleep, of suffering, and of alarm and apprehension of impending suffocation. Internal examination discloses the tonsils symmetrically enlarged, extending to the median line of the throat and obstructing it. Palpation by the finger may detect the softness and fluctuation of pus. In from five to eight days the sup-

purated tonsil bursts, all the symptoms vanish, and recovery is speedy. In its formative or first stage quinsy may sometimes be aborted by scarification, by ice in the mouth, cold gargles or spray, and astringent gargles or applications, as of alum or tannin, and by internal administration of saline cathartics and arterial sedatives. Quinine boldly administered may abort it. When developed, the inhalation of steam, warm anodyne gargles, soothing poultices or fomentations externally, anodynes to secure rest, tonics and diet to sustain the strength, and early evacuation of pus with the knife, are the essentials of treatment.

Rash, a popular name for the acute exanthematous or eruptive diseases, or more frequently for the eruption itself which attends such diseases. Nettle rash or urticaria, scarlet rash (roseola), and canker rash (scarlet fever) are the diseases generally called by this name, which, though convenient for nursery use, is of no scientific value, for the diseases have nothing in common with each other.

Rectum, Diseases of [Lat. *rectus*, "straight"]. The rectum is the third and last portion of the great intestine, receiving the fecal matters from the colon, and opening outward by the anus. Not infrequently in new-born children occur congenital defects of the rectum; such are preternatural narrowness of the anus, imperforate anus, absence of the anus, with partial or complete non-development of the rectum. In childhood disease of the rectum is exceptional; atony and relaxation of its muscular coat may result in obstinate constipation and overloading of the rectum with feces. Reversely, in strumous and delicate children continued diarrhoea may result in prolapse of the rectum or protrusion, usually of the mucous membrane only, less frequently of the muscular coat. Adults are subject to numerous rectal diseases. Dysentery is not infrequently limited to the rectum. (See DYSENTERY.) Chronic ulcer is a frequent sequel of the destruction of tissues in dysentery; ulcers may also arise from tubercular or syphilitic deposit. Irritable ulcer of the lower end of the rectum, especially just within the sphincter muscle of the anus, is termed a fissure. It causes intense pain when stretched by the passage of feces, and the dread of suffering causes voluntary inaction of the bowels and habitual constipation. Fissure often can be detected only by use of the rectal speculum, the patient being anesthetized by chloroform. Stricture of the rectum is often the result of former dysenteric inflammation, ulceration, sloughing, and the subsequent formation of dense scars of fibrous tissue. It

results in obstruction, difficult and small stools, constipation, straining and bearing-down pain in the bowels, loins, and lower region of the back, with general depression of health. Stricture is often the result of cancer of the rectum, when, in addition to the symptoms and signs of stricture, exist also the cachectic facial appearance and progressive emaciation of the body indicative of cancer, and intense lancinating pains in the rectum, due to the malignant local growth. Hæmorrhoids or piles (see PILES) are the frequent result of congestions and inflammation of the abundant venous circulation of the rectum and anus. Polypus of the rectum is an attached tumor, originating in a relaxed fold of mucous membrane, or in a hæmorrhoidal mass, or redundant growth following the healing of ulcers; it may grow to such size as to obstruct the bowel, or by the dragging efforts of defecation be protruded from the body. Fistula in ano is the result of abscess adjacent to the lower bowel or verge of the anus, the purulent contents being discharged into the rectum, and leaving an unhealed passage or sinus. There may be an additional sinus opening on the surface without the anus; fistula may also be "blind," or terminating in a *cul-de-sac* adjacent to the bowel, but opening only externally. The origin of fistula is usually piles, constipation, or other disease of the lower rectum. Intense neuralgia of the rectum, though a frequent forerunner of malignant disease, is often present in persons reduced in health or of highly nervous temperament. Pruritus of the anus (obstinate itching) is often present, associated with constipation, piles, the climacteric period, and old age. Eczema often affects the anus.

Præternatural narrowing of the rectum demands stretching by the fingers, aided by anæsthesia and the use of rectal sounds. The imperforate anus is to be punctured or incised, and kept open by sounds while healing. Prolapse usually yields to improved diet, tonics, and internal and local use of astringents. Excision of a chronic prolapsed rectum is rarely demanded. Ulcers may be treated by astringent tonics, but more effectively by local use of suppositories or direct caustic applications through a speculum of considerable size. Fissure may be cured by keeping the bowels habitually open and by local use of anodynes, astringents, and mild caustics. A more certain cure is by rupture of the sphincter ani under anæsthetics, allowing the fissure or ulcer a period of rest. Stricture when not malignant may be relieved by cautious incision and subsequent use of large rectal sounds. The operation endangers perito-

nititis and portal phlebitis (inflammation of the portal vein), with abscess of the liver. Cancer of the rectum is incurable. The intense pain is modified by keeping the bowels open and by local and internal use of anodynes, opium and atropine being most efficacious. (See FISTULA and PILES for treatment.) Neuralgia, pruritus, and eczema demand local use of anodyne and emollient suppositories and ointments, while the constitution is improved by corrected diet and tonics.

Relaps'ing [Lat. *relabor, relapsus*, "to fall back"] **Fe'ver**, also known as **Famine Fever**, and, technically, as **Febris Recurrens**. Its nature is undetermined—by some regarded as a form of typhus, by others as due to malaria. It occurs only at intervals of some years, and then during seasons of privation and insalubrity, attacking chiefly the lower classes, ill fed and housed. It has been so prevalent in crowded communities, as Liverpool, as to be regarded an epidemic and contagious disease, but careful study connects it with dietetic and telluric causes, prevailing in the form of a non-contagious endemic. Its formative or incubating stage is from four to ten days; rarely it is spontaneous in its development. Its onset is sudden; the patient, having been perfectly well at the time, is able to fix the exact time of the attack. It begins with an abrupt and severe rigor, or chill with nervous tremor, and immediate sense of extreme weakness. There is sharp frontal headache, pain in the back and limbs; then follow flushed face, thirst, dry tongue, high pulse, and a steady ascent of body heat. The facial expression and temperature are characteristic. The mind is unaffected, and the conscious face, with the sunken but clear and full eye, wears a pitiable, helpless, appealing look. The complexion has a bronzed hue, and may be slightly jaundiced. The temperature steadily ascends during four or five days to 105°, 106°, 107°, 108° F.—an unusual fever heat unaccompanied by brain symptoms or danger of death. Physical examination may detect enlargement of the liver and spleen; the urine may contain not only albumen and urea in excess, but blood and casts indicative of acute congestion of the kidneys. The fever and extreme depression last from five to seven days, when, with some critical evacuation, as profuse perspiration, diarrhœa, or urination, a sudden abatement and rapid convalescence sets in. Appetite and strength are slowly returning, and the invalid is about, when, on the fourteenth day from the first attack, he is seized by a second or relapse resembling the first. Very rarely a third, fourth, and even a fifth relapse occurs. Relapsing fever, however severe, is

rarely fatal. During the epidemic in New York the cases were in the general hospitals with other patients, and no evidence of contagion followed. The treatment during the active period is essentially antiphlogistic and expectant—cooling drinks, gentle saline laxatives, sponging, light diet; during convalescence, free use of concentrated liquid diet, tonics, especially liberal use of quinine and brandy.

Remittent [Lat. *remittere*, to "send back"] **Fever**, a non-infectious, non-contagious fever of malarial origin, but differing from intermittent fever in that it has no prolonged intermission or apyrexial period. Although there is at no period of the twenty-four hours a complete cessation of fever, there is daily a perceptible or marked abatement or diminution of the elevated temperature and associated symptoms. This period is termed the remission. The characteristics of this fever vary with the country and season in which it occurs. The ordinary autumnal remittent, the bilious remittent of England and the U. S., is comparatively mild. Conversely, the remittent of intensely malarial regions, as the borders of the Mediterranean, the Isthmus of Panama and of Suez, the African jungles, and of Bengal, is severe and fatal. When the invasion of the disease is mild there will have been a precursory period of *malaise*, languor, mental inaptitude, and sleepiness. When violent in its onset, often no such warning symptoms have pre-existed, but the initiatory chill has been speedily followed by intense delirium, changing to coma, internal congestions, and death. Such "congestive," "pernicious," "fulminating," or lightning-like attacks are rare in temperate climates. Usually, remittent fever is ushered in by a distinct chill or by general chilliness and sense of cold down the back. There are headache, giddiness, mental dulness, and confusion, a sense of oppression and lassitude; soon there is delirium. The face is flushed, the pulse full and frequent, the tongue dry and furred, the skin intensely hot, the temperature rising as high as 105° F. In the bilious form there are nausea and vomiting, pain at the epigastrium, with tenderness on pressure. Frequently, the fever thus runs at its height, without modification, during sixteen or eighteen hours, when the remission begins. Such a period of fever is accompanied usually by symptoms indicative of congestion of important internal viscera. Thus, with the first fever-period pulmonary congestions have been denoted by labored breathing, thoracic oppression, and livid face. With the remission these secondary congestive signs abate. The remission usually begins toward morning, though in grave cases postponed and

irregular, succeeding a febrile period of twenty-four or even thirty-six hours. The remission may last from an hour or two to eight or twelve, the attack being mild in proportion as remissions are definite and prolonged. The return of fever may have a mild precursory chill, the temperature again rises, and new congestive symptoms develop, perhaps of the liver, as shown by hepatic pain and tenderness and vomiting of bile. Thus, in successive febrile periods various internal viscera are the seat of a determination of blood—the ovaries and uterus often, as shown by metrorrhagia. The duration of remittent fever may be seven, fourteen, or twenty-one days, seeming to observe a law of septenary crises. It may terminate abruptly in resolution by sweating, or lose its distinctive type and run into a low, typhoid fever. The person convalescent presents a noticeably dusky complexion, a depression of the health and strength for many months, and inactivity of the liver, with liability to jaundice. Percussion often demonstrates enlargement of the liver and spleen. In fatal cases autopsy reveals a characteristic "bronzing" or pigmentation of the liver and spleen. The treatment of this fever should keep in view to quickly shorten the exacerbations or febrile periods and relatively lengthen the remissions. Cold and effervescing draughts and saline aperients should be given at once and repeatedly, and the period of remission utilized by the free exhibition of quinine to anticipate and lessen the gravity and duration of the next period of fever. In critical cases quinine to act certainly must be administered in full doses hypodermically—ordinarily, in large repeated doses by the mouth. Congestion of special organs, the brain, lungs, liver, demands local measures, leeching, cupping, blisters, warm and anodyne fomentations. The usual antiphlogistic agencies are indicated, and supporting liquid food at regular intervals. Tonics, as bitter vegetable infusions and the mineral acids, hasten convalescence.

Renal [Lat. *renes*, "kidneys"] **Diseases**, or **Diseases of the Kidneys**, are mostly of an inflammatory nature. According to the location and character, there are many different affections. Inflammation of the pelvis is called *pyelitis*, and is generally a continuation of catarrh of the bladder. The tissue of the kidney proper might be the seat of all kinds of inflammatory processes, from simple hyperæmia (and in consequence thereof bursting of blood-vessels and bleeding) to the most severe forms of hyperplastic action, with deposition of diphtheritic and croupous masses. The name **BRIGHT'S DISEASE** (which see) used to comprise the majority

of these forms, which a more distinct knowledge now keeps asunder. The most important symptoms of the kidney troubles arise from the fact that the epithelium of the canaliculi is detached, thereby allowing the albumen to escape. (See BRIGHT'S DISEASE.) In more advanced cases the secretion of urine is hindered, and even suppressed, and the urea in the blood (uræmia) leads the affection to a fatal end. Of other renal disorders may be mentioned the formation of gravel and stone, giving origin to so-called renal colic and some new formations, especially cancer of the kidneys. Perinephritis is inflammation of the cellular tissue around the kidneys; large abscesses may take their origin therefrom, which can be cured by making an incision and thereby giving the pus a free outlet. (See articles on ALBUMINURIA, BRIGHT'S DISEASE, CALCULUS, DIABETES, LITHIC-ACID DIATHESIS, OXALURIA, PHOSPHATIC DIATHESIS.)

Reten'tion [Lat. *retentio*] of **Urine**, a condition in which the urine cannot be evacuated from the bladder at all, or only with great difficulty, the former being known as complete, the latter as incomplete, retention. It should not be confounded with *suppression*, in which the urine has not been excreted by the kidneys, and consequently the bladder is empty. The symptoms consist of a great and urgent desire to pass water, and partial or complete inability to do so; this is accompanied by repeated straining efforts and violent pain, and extreme distress and restlessness; the countenance assumes an anxious expression, the pulse is quick, and the skin dry. The bladder is more or less distended according to the protraction of the trouble, and its position may be ascertained by percussion above the pubes. If this condition is not speedily relieved, it results in rupture of some portion of the urinary tract and extravasation of the contents of the bladder into the surrounding parts. Here the urine acts as a foreign body, and causes an inflammation which soon terminates fatally.

As the treatment of this condition varies with its cause, we shall have to consider them together. The causes are numerous, and may be classified as those due to—(a) mechanical obstruction; (b) paralysis of bladder, partial or complete; (c) hysteria. The agents mechanically obstructing the flow of urine are numerous. Organic stricture of the urethra is a very common one, but it causes complete retention only when, after exposure of some kind or over-indulgence in spirituous liquors or sexual excitement, there is congestion or spasm added to it, and the urethral canal thus made impervious. The attempt should here be made to use a small catheter, but if this cannot be done, the

warm bath, local abstraction of blood, and the administration of ether or chloroform should be superadded. Should these means fail, the only resource left is to "tap" the bladder, either through the rectum or above the pubes. This is done at the present time by means of the *aspirator*. The relief, however, is only temporary; the stricture still remains, and some operation must be resorted to for its relief. Spasmodic contraction of the muscle surrounding the neck of the bladder or of the muscular coat of the urethra sometimes exists as a cause of retention; when such is the case, the warm bath, purgatives, opium, and chloroform are the remedial agents. Inflammation along the urethral canal (gonorrhœa) often has retention of urine as a complication. Here it is caused by an intensely-congested and swollen mucous membrane, and the same treatment as for muscular spasm may be adopted. Amongst the other mechanical causes the most important are—(a) a small calculus impacted in the urethra; (b) small tumor in the urethra; (c) clotted blood in the urethra or bladder; (d) foreign bodies, as pieces of bougies, catheters, etc., in the urethra; (e) tumors of any kind, external to the urethra, which press upon it. This last cause operates quite frequently, and it embraces all those cases of retention due to chronic enlargement of the prostate, inflammation or acute congestion of the prostate, abscesses in the perineum, pressure of a loaded rectum, a displaced uterus, the head of the child during labor, or a pelvic tumor of any kind upon the neck of the bladder. The treatment should always be directed to the removal of the cause, and where this requires any great amount of time, we have the catheter and aspirator as palliative means. Paralysis of the bladder, causing retention, may be due to voluntary retention repeated and long kept up, apoplexy, injury to the spine, acute over-distension of the organ, shocks to the system from capital operations, and in certain high fevers, as typhoid, typhus, etc. The treatment in all these cases should be by the catheter. Hysterical retention is a disease of the mind, and depends wholly upon the volition of the patient. (See HYSTERIA.)

Rhachi'tis. See RICKETS.

Rheu'matism [Gr. *ῥευματισμός*], an inflammation which attacks fibrous structures in various parts of the body, and most commonly those of the joints. It presents itself under various forms, but they may all be embraced under the following: acute rheumatism and chronic rheumatism.

Acute rheumatism, known also as *inflammatory rheumatism* and *rheumatic fever*, may be defined as an idiopathic inflammation

of the synovial capsule of one or more joints, which is accompanied by slight exudation into the joint and œdema of the connective tissue surrounding it. There seems to be an hereditary predisposition to the disease, and the attacks are very liable to recur in the same individual. It occurs in healthy persons between the ages of ten and forty. The exciting cause is generally found to be a "cold" or a residence in damp places; it usually occurs in the winter and spring, and is oftenest met with in the temperate zone. Before the onset of the disease there is at times a feeling of *malaise* lasting for a few days; sometimes the malady is ushered in suddenly by a chill, which is immediately followed by a high fever and pain in one or more of the larger joints. This pain soon becomes unbearable, and the patient cannot allow the slightest motion, nor even the weight of the bed-clothes. The affected joint will be found swollen, and at times red. The joints most commonly affected are the knee, foot, shoulder, elbow, and hand. When a number of joints are affected at one time the patient's condition is indeed pitiable, as it is impossible for him to make the slightest movement without suffering the most intense agony. The complications liable to be encountered are inflammations of the fibrous structures of the heart, lungs, brain, and spinal cord, and the duration of the disease, if untreated, is from two to five or six weeks. It generally ends in recovery, except in those cases which have a severe complication. The treatment should consist of purgatives, diuretics, narcotics, and colchicum; locally, either evaporating lotions or warm applications, the latter best secured by warm water and alcohol (2 parts to 1), and surrounding the limb with flannel. If treated at its outset by the more recent remedies, salicylic acid and salicylate of soda, in heroic doses, the disease may be broken up within forty-eight hours, though the patient remains much debilitated. This treatment has the great advantage of averting the danger of heart complications.

Chronic rheumatism is a chronic idiopathic inflammation of the fibrous tissues of the body, which produces very little change in the structures of the affected part. The predisposing causes may be congenital or acquired. It may follow the acute variety, or exist from the beginning as a chronic affection; one attack predisposes to another. The exciting causes are those of acute rheumatism and damp weather and an easterly wind. There are several varieties of chronic rheumatism. In one there is a constant pain, lasting for a long time in certain single joints, which is aggravated by pressure

or motion. In another a series of mild attacks of rheumatism, simulating greatly the acute variety, generally occurs at every change of weather or upon the slightest exposure. When once established it is generally hard to get rid of. *Muscular rheumatism* is a chronic rheumatism of the fibrous sheaths of the muscles, and is known as *lumbago* when occurring in the back, where it occasions ludicrous contortions of the body when the patient attempts to move, in order to spare the affected parts; *wry neck* is a similar affection in the neck; and *pleurodynia* is a chronic rheumatism of the muscles of the side and chest. As to the treatment of chronic rheumatism, we have no specific. Probably the nearest to it is the iodide of potassium, which should be given. Sedatives are also useful to relieve pain and procure sleep. Particular attention should be paid to the digestive organs, as derangement always aggravates the trouble. The various mineral springs possess no virtue except from the diuretic action of their waters.

Rick'ets, a term applied to a distortion of the bones, especially those of the extremities, which is the result of a diseased condition arising from mal-assimilation of the ingredients which properly form the bone-substance, and by which they are deprived of the proper supply of earthy materials. It is a disease of early life, occurring as a rule in infants from twelve to eighteen months of age. The predisposing causes are the influence of an impure or poisonous atmosphere, improper food and clothing, and poorly ventilated, damp apartments, especially if they be deprived of sunlight. The symptoms are not well marked and characteristic in the early stages; they develop gradually and almost imperceptibly. The little patient seems to lose his spirits, and his general health fails; indigestion sets in, and is accompanied by swelling of the abdomen and colic. As a consequence, we have emaciation taking place to a marked degree, the muscles becoming soft and flabby, the face sallow, and the skin dry, and there are scanty and turbid urine and thin fetid evacuations. The fontanelles and sutures remain open until a late period, and there are often noticed a profuse sweating of the scalp, and a rolling of the head upon the pillow which results in a baldness of the back of the head. The teeth are very late in making their appearance, and decay rapidly after doing so. As the disease advances the bones grow softer and softer, and become distorted by the superincumbent weight and muscular contraction. The bones of the extremities are bent, shortened, and twisted, and the ends enlarged.

The ribs become flattened by atmospheric pressure, and drawn inward by the contraction of the diaphragm, and as a consequence we have the sternum pushed forward in front, and the deformity known as pigeon or chicken breast. As a disease of the bones, rickets is never dangerous. It is from the deformities resulting, and their interference with the action of the lungs and other viscera, that the danger arises. The treatment can be summed up in a few words—fresh air, sunlight, good food, bathing, and *cod-liver oil*. The deformities may be remedied to a certain extent by the use of splints. In after life, when the bones have become hardened, a wedge-shape piece may be taken from the convex side and splints applied.

Ring-worm, a parasitic cutaneous disease occurring most frequently among children and upon the face and neck. It was formerly described as *herpes circinatus*, and regarded as a vesicular disease. It is more properly *tinea circinatus*, being analogous to *tinea sycosis*, or barber's itch, and *tinea decalvans*, or bald spots of the head. These diseases are due to a parasitic growth, consisting of innumerable sporules which find a nidus in the hair-follicles and excite secondary inflammation of the skin. Ring-worm is contagious, not only from person to person by close contact, but in the uncleanly is transplanted from spot to spot on the head and hands or wrists. The treatment is by "parasitocides," or remedies destructive to parasitic life. Local application of tincture of iodine, iodine and ammonia, sulphurous acid, sulphur dry or in ointment, carbolic acid, creosote, oil of cade, mercurial ointment, oleate of mercury, solution of corrosive sublimate, and cantharidal collodion.

Ru'pia [from the Gr. *ῥύπος*, "filth"], a severe and chronic skin disease, usually, but not always, syphilitic in its origin. It generally begins in blebs filled with a sanious fluid. These finally become ulcers covered by a thick scab. The disease appears in broken-down patients, and is to be met with tonics, good food, cleanliness, the use of iodide of potassium, etc. Locally, the ulcers may be poulticed and then touched with caustic.

Rup'ture. See HERNIA.

Saint Anthony's Fire. See ERYSIPELAS.

Saint Vi'tus's Dance. The form of disease that received this name was a species of chorea which broke out at Strasbourg in the year 1418, following the plague. The same disease appeared in Aix-la-Chapelle as an epidemic in the fourteenth century, and was then known as "St. John's Dance." Almost simultaneously a malady originated in

Italy, there called *tarantism*, and identical with the dances of St. John and St. Vitus. These several conditions presented common symptoms, consisting of jumping, fantastic dancing, and involuntary cries; with these strange symptoms there was catalepsy, when the victim would have visions of either St. Vitus or St. John. These seizures would last until the sufferer was entirely exhausted. On the feast-day of St. John the disorder made its appearance. The people in the course of their dissipation would kindle large fires through which men and women leaped, believing that the attacks would be aborted by this procedure. The excitement attendant upon this undoubtedly brought on the disease. The dance of St. Vitus received its name from the fact that the sufferers went when afflicted to the chapel of St. Vitus, assured that this holy person would listen to their prayers and those of the priests, who also sang masses and interceded for them. All persons of this class who before had St. John's dance now had the dance of St. Vitus.

This name is applied to the disease even at the present day as a common term. In the seventeenth century the disease changed its character somewhat, hysteria being a prominent symptom, and there was a disappearance of a great many of the maniacal outbursts. The condition known as tarantism was supposed to be due to the bite of the tarantula, but in reality it was caused by actual morbid fear of the consequences of a bite. The patients were dull and moody until they heard certain kinds of music. They would then leap into the air in a state of frantic excitement, and dance in an extravagant manner; some would be impelled to cast themselves into the sea, and others would commit disgraceful sexual excesses. They usually danced until utterly worn out, and then fell to the ground. Wind instruments and drums produced the music which seemed to influence them the most quickly. There are numerous cases of chorea recorded in late years that closely simulate the tarantism of several hundred years ago. Dr. Kinder Wood of England had a patient who suffered from this form of chorea; the roll of a drum would stop the attacks. A species of dancing disease very closely allied to St. Vitus's dance appears in certain parts of Africa, particularly in Abyssinia. The disease is known as *tigritier*. The malady begins in an acute form, and runs at first the course of an ordinary continued fever. The priest is appealed to, who arranges the programme and conducts the ceremonies. He leads the patient out into the marketplace; when music is played by a band of his dusky friends he begins to dance, and

continues all day; he then stops, turns irresolutely, and starts off on a run, and goes a great distance, not stopping till utterly fatigued, when some one of the tribe strikes him on the back with the flat part of the blade of a large knife, and asks him his name. If the disease has disappeared and the mind cleared up, of course he will be able to tell it. Full particulars of this interesting condition are given by many of the English travellers.

It seems as if these same superstitious diseases were not confined to the Middle Ages or to barbarous people. Frequent illustrations of a modern form are shown at the present day among the many fanatical sects affected by kindred conditions. Dancing Shakers, dancing dervishes, and the members of religious societies in France known as *convulsionnaires* have these peculiar choreiform attacks as a part of their religious ceremonies. Our own camp-meetings abound in examples. Attacks of the disease last frequently for months, and young women often become the victims of a peculiar morbid emotional state which frequently renders their incarceration in an asylum a matter of necessity. These attacks result from a depressed condition of the system, as a sequence of a long-continued state of emotional excitement, of fasting, and, to a certain extent, contact with other individuals affected like themselves. Schele de Vere relates in his *Modern Magic* that in the consecration of a magnificent church at Liege a great many people affected with St. Vitus's dance gave themselves up to shameless dances, and falling exhausted, after spasms and convulsions, requested friends to press violently upon their chests, and thus a seizure was stopped.

The violent forms of chorea of modern times differ from the ancient St. Vitus's dance so far as the mental condition is concerned. The victims of the disease now rarely believe themselves to be possessed. The superstition and ignorance of the Middle Ages did much to foster a general belief in possession by the devil. This is evident from the manner in which cures were effected, by the laying on of hands and exorcising by the priests. Of course the power of advanced religious knowledge and increased ability for reasoning, improved morals, and increase of Christian faith have entirely changed the barbaric character of the disease. (For symptoms and treatment see article on CHOREA.)

Salaam' Convul'sions, a rare and remarkable disease of children, accompanied by rapid bowing of the head. It sometimes occurs periodically. It is a clonic spasm of

the sterno-mastoid muscles. Its cause, nature, and treatment are very obscure. Iron, zinc, and nux vomica have been recommended. The disease may possibly pass away with the completion of the teething process, but epilepsy or idiocy sometimes follows.

Saliva'tion [Lat. *saliva*], a specific irritation of the salivary glands, mouth and throat by mercury. In former years, mercury, in heroic doses, ranked as a remedy second only to bloodletting. Salivation was a frequent occurrence—intentionally produced in many cases, in others the accidental result of large doses and individual susceptibility. Children will endure large doses of mercurials without salivation; adults are relatively susceptible. An open and active state of the skin, kidneys, and bowels favors immunity from salivation, even when the mercurial taken is considerable; reversely, if opium or any remedy which checks the glandular activity and functional excretion of kidneys or bowels be taken before or at the same time, even small doses of mercury, thus detained in the system, may salivate. Mercury to-day is chiefly employed in laxative and cathartic doses, eliminating itself as it performs its intended action; also in small repeated doses for alterative effects in some intestinal disorders of children and in certain specific diseases of adults. Hence, salivation is rare to-day. Salivation is manifested by a coppery or metallic taste, by soreness of the gums, tenderness of the jaws and teeth when pressed together or closed with force, excessive secretion and flow of saliva, even dribbling from the mouth; swollen, red, ulcerated gums; swollen, coated, salivary tongue, taking the imprint of the teeth; and a foul "mercurial" breath. In grave cases, spongy, bleeding, sloughing gums, loosened teeth, swelling of the face and neck, and even gangrene of the mouth, may result. There is accompanying constitutional depression, slight irritative fever, pain, sleeplessness, and sense of choking. The condition requires prompt saline cathartics, very astringent gargles for the mouth, rich liquid food, and tonics.

Salt Rheum. See ECZEMA.

Scabiaritic Disease. See SCABIES.

Scab'ies [Lat.], or **Itch**, is a parasitic disease of the skin. It affects chiefly the hands, more especially the webs of the fingers, their inner surfaces, and the back of the hand. Less frequently it extends to the arms, and rarely the feet, legs, and abdomen are affected. The scalp may be invaded, but the face is exempt. This disorder infests children, who receive the peculiar insect from person to person by contact in school or play, and its lodgment is facilitated by neglect to wash

perspiration and dirt from the hands. Persistent and annoying itching is experienced; careful inspection detects small red elevations, points of irritation, papular at first; soon these become vesicular or watery at the tip, white-capped points, and often from scratching are rendered pustular, and later scaly. Closer inspection discloses small red lines connecting these vesicles or branching from them into adjacent healthy skin. These red lines are subcuticular channels, produced by the burrowing of the itch-insect beneath the cuticle or scurf-skin, and the vesicles are the result of inflammation to which its presence and irritation have given rise. The insect will not be found in the fluid or cavity of the vesicle, but by laying open the diverging canals with a fine needle may often be found at its end. This parasitic insect is known as the *Acarus scabiei*, or *Sarcoptes hominis*. It is a minute whitish insect, from $\frac{1}{100}$ th to $\frac{1}{50}$ th of an inch long. The male is least often found, being migratory in his habits, and small. His head is provided with two mandibular organs and four palpi or bristles; the adult male has eight legs. The female is sedentary in habits, and more easily found, especially at the ends of channels, where she lays her eggs. The acarus makes its progress beneath the epidermis by means of suckers or disks upon its legs, and by aid of bristles upon its back, directed backward. Hahnemann ascribed itch to a supposititious cause, a subtle humor, which he termed *psora*; but the microscope has established the parasitic nature of the disease. The treatment of scabies is to kill the parasites. Remedies producing this end are termed parasitocides. Chief among these is sulphur, in ointment, powder, or vapor. Sulphurous acid is a convenient application. Carbolic acid, kerosene, petroleum, strong alkalis, solution of corrosive sublimate are also efficacious. Even when cured as a specific disease, the redness and vesicles may linger, a chronic condition of irritation. Soothing ointments are then indicated.

Scald. See BURNS AND SCALDS.

Scald-Head. See FAVUS.

Scarlati'na [N. Lat.], or **Scarlet Fever**, one of the acute eruptive or exanthematous fevers. Chiefly a disease of childhood with immunity for adults, increasing as the period beyond puberty lengthens. It is an infectious disease, but propagated often by contagion or close aggregation of children, as in schools, asylums, or at play; therefore occurring sometimes in local epidemics; at other times, with a graver type and great mortality, involving whole communities. In different individual cases, as well as different seasons and epidemics, it assumes variable degrees, from a trivial disorder to a malig-

nant and hopeless attack. However, no case is without danger. While in the well-defined scarlatina sore-throat, high fever, and the scarlet eruption or "efflorescence" are present, in the undeveloped and trivial attack the kidneys are perhaps equally liable to be seriously involved. Physicians recognize three marked varieties: (1) *Scarlatina simplex*, simple scarlet fever, in which the "rash" or eruption is fairly developed, the patient comfortable, and complications do not exist; (2) *scarlatina anginosa*, where an unusual soreness of the throat, with formation of pseudo-membrane resembling diphtheria, is present; (3) *scarlatina latens*, a latent form, where the eruption may be absent or doubtful, but grave injury is done by the scarlatinal poison in the blood to the nerve-centres or the kidneys. Like other contagious diseases, scarlatina has its period of "incubation" or development; four to six days usually intervene between exposure and the consequent attack. The fever develops, sometimes a simple and steady rise of temperature, more often with projectile vomiting, nervous excitement, and exhaustion indicative of a powerful impression on the nervous centres. The temperature may rise to 104° or 107° F., higher in fatal cases. The throat is already florid and tender, the tongue studded with sensitive red papillæ. At the end of twenty-four hours of fever the eruption appears—an efflorescence composed at first of minute red points upon a flushed surface, and later of a uniform scarlet hue. It develops upon the body and neck before the face, being especially developed over the upper half of the back. The face and lower extremities are soon involved, and the cuticle, destroyed by the high temperature of the surface, may begin to fall by the fifth day. This process of "desquamation" varies. In mild cases, when sponging or bathing has been employed to allay fever, no flaking or falling of the cuticle is seen. In others it may slowly separate in shreds and patches. Still again, the cuticle covering fingers and toes may exfoliate intact, forming perfect casts or like the finger of a glove. During and following this desquamation danger is greatest of acute inflammation of the kidneys, the "desquamative nephritis" constituting the most serious sequela or complication of scarlet fever. Scarlet fever is a grave disease. The mortality is very variable, from 1 in 5 to 1 in 25, according to class of patients and type of epidemics. The chief causes of death are early convulsions, diphtheritic throat complications, and uræmic poison and dropsy from implication of the kidneys. Scarlatina is chiefly to be distinguished from measles, since these are the two prominent eruptive

fevers of childhood. It lacks the early developments of measles—watery eyes, sneezing, cold in the nose, loaded tongue—and presents its peculiar eruption two days earlier than that of measles.

(1) In scarlet fever treatment is chiefly directed to confining the temperature within limits by the use of aconite, diaphoretic drinks, blanketing, frequent sponging, or even the wet pack. (2) To favoring the action of the kidneys by digitalis and emollient alkaline drinks, as flaxseed tea and soda. The inunction of lard, practised by the Germans, and of butter of cacao, protect the skin and guard the kidneys from congestion. (3) To maintain the strength and counteract the poison of the disease. Quinine and tincture of iron are chiefly indicated, in free and frequent doses. Sulphite and sulphocarbonate of soda and salicylic acid may be administered for their antiseptic effect. Liberal liquid diet throughout, and mild alcoholic stimulus when convalescing. The throat may require cold gargles, cold and disinfecting sprays. Secondary kidney disorder—dropsy and scanty urine—calls for dry cups over the kidneys, the hot-air bath, elaterium as a purge, digitalis, and alkaline diuretics.

Scar'let Fe'ver. See SCARLATINA.

Sciat'ica [L. Lat.], *neuralgia ischiadica*, a neuralgia of the great sciatic nerve, the sacral plexus, or any of the nerves of the thigh and hip. According to Niemeyer, the cutaneous nerve of the thigh, the superficial branches of the peroneal nerve, and the sural nerve are the principal seats of what is called sciatica. Exposure, rheumatism, gout, tumors near the nerve, fecal masses, hæmorrhoids, diseased vertebrae, metritis, and perimetritis are reckoned among the causes. It sometimes follows a severe labor in childbed. Laxatives, cupping, leeching, the moxa blisters, hot baths, and local or general anodynes are frequently palliative, and sometimes curative. Periodic sciatica may often be relieved by quinine. Salicylic acid, iodide of potassium, and turpentine are sometimes extremely useful, and so is the constant electric current. It is, however, a most obstinate and distressing complaint.

Scrive'ner's Pal'sy, or Writer's Cramp, a derangement of the motor nerves of the fingers and thumb, usually of the right hand, caused by over-exercise with the pen, combined with inattention to the mechanism of the arm. It may also attack musicians, milkers, seamstresses, shoemakers, and others who employ to excess the same nerves, but is then generally known by other special names, such as "cobbler's spasm." It is frequently attended with spasmodic and uncontrollable movements of the fingers. Dis-

continuance of the causative vocation is essential. Devices to steady the hand and efforts to train the left hand to act as a substitute fail, showing that a defect has been developed at the educated brain-centre presiding over the trained muscular activity which was employed to excess. It should be treated with tonics, particularly iron, and galvanism has been employed with good effect.

Scrof'ula [Lat. *scrofa*, "a breeding sow," swine being affected by a similar disease]; also known as **Struma** (from Lat. *struere*, to "build"), since the lymphatic glands are enlarged in this condition. Persons of the lymphatic temperament are most liable to develop the marked symptoms of struma or scrofula. Scrofula is hereditary in many families. In many other persons it arises *de novo* from bad hygiene and regimen, especially in children when rapidly developing. Disordered digestion, uncleanly skin, deficient clothing, foul air, are its causes. Many symptoms of disordered blood-states formerly grouped as scrofulous are now distinguished as having definite causes. Eczema, though often an exponent of struma, is as often due to other causes—nervous influences, rheumatic taint, gastric and intestinal derangements. The scrofulous person is light complexioned, the skin is white, the body often full, or even obese, but the muscles soft and flabby. In the child the head is large relative to the body, the eyes full and white, the teeth white, tending to fracture and early decay. The chest often lacks symmetry, the breast-bone prominent, the bones of the arms and legs often are unduly long, with prominent bulbous extremities. Such conditions, more advanced, constitute the "rickets." The chief characteristic of scrofula is the susceptibility of the glandular system. Either persistently or with every slight impairment of health the glands of the neck, groin, abdomen, etc. become indurated and enlarged. Such swellings may be evanescent or leave permanent indurations. The glands of the neck frequently are so engorged with "scrofulous" exudative matter that it becomes "caseated"—a state of fatty degeneration—or actually suppurates, producing scrofulous abscess. Scrofula is not, then, a definite specific disease, but a condition of serious perversions of the nutritive qualities of the blood, and resulting affections of the various tissues and organs of the body. Enlarged glands, moist skin diseases, superficial abscesses, unsymmetrical developments of the teeth, nails, and bones are some of its manifestations. Inherited scrofulous taint may remain latent until developed by depressing sickness. Thus, measles, a harmless disorder in robust

children, is hazardous when struma lurks in the system. The bottle-fed infant and the foundling are more often scrofulous than the nursed, home-reared child. The mucous and serous surfaces are very liable to disease in struma,—subacute and tubercular meningitis, hydrocephalus, chronic bronchial catarrh, diarrhoea and cholera infantum, and marasmus. The relation of scrofula and the pulmonary tuberculosis of adults is disputed. That strumous and scrofulous persons are very liable to develop phthisis is, and has always been, generally conceded. Very prominent pathologists to-day regard scrofula and tuberculosis as separated only in degree. The discovery by the microscope that yellow tubercle is merely "caseous" or fatty metamorphosed matter, and gray tubercle an exudation or deposit rather than a definite structure, supports this view. The disastrous effect of pulmonary tubercle depends largely upon the preceding low blood-state, largely upon the close structure and functional disturbance of the lung invaded. Simon terms scrofula the soil for tubercle; Wilks calls scrofula a primary tubercle, a secondary form of a common disease. A majority of cases of pulmonary consumption are, however, disconnected with scrofula or struma, the result of preceding inflammatory processes in the pleura, bronchial tubes, or lung-tissues. The treatment of scrofula is hygienic and nutritive—warm clothing, bathing, friction to the skin, pure air, correct rich diet, special articles of diet, as the hydrocarbons or fats and preparations of phosphates. Iron, iodine, and arsenical preparations act as alteratives to reduce glandular enlargements.

Scurvy [Lat. *scorbutus*, a hybrid word from a Scandinavian root, *scorb*, and the Latin termination *-utus*], a diseased blood-state, induced chiefly by prolonged privation of fresh vegetable and animal food. Although not exclusively a sailor's malady, its ravages have been most disastrous at sea, devastating, previous to this century, the navies and merchant marine of all nations. Pizarro's squadron included 2700 men, of whom but 100 survived. Ships were often lost adrift at sea, the crew unable to work and perishing. Anson's English fleet in 1742 in nine months lost 626 out of 961 men. The chief cause of this pest of the marine was the exclusive diet—salt meat and hard, dry bread, with impure and deficient drinking-water—upon which sailors subsisted during prolonged voyages. Exposure to cold or to tropical heat, fatigue, and the unsanitary and foul condition of ships contributed to the development of scurvy. As early as 1617, Wodall recorded the virtues of lemon-juice in curing this disease, and in isolated cases its use and a vegetable

diet saved the crews so treated. But not until the latter half of the eighteenth century were improved ship hygiene and vegetable diet at sea enforced. Thus, only thirty years after Anson's fearful loss, Capt. Cook sailed on a three years' voyage around the world, losing but one man by disease. Parry in three polar expeditions of a year and a half and two years' duration lost only 7 men out of 334. To-day, scurvy is almost unknown at sea, but it occurs occasionally on land, in garrisons and prisons, and in communities suffering from starvation. All of the symptoms of scurvy are directly connected with the impoverished, impure state of the blood. The fibrin of the blood is less and its coagulability decreased; the salts of soda are lessened, the red corpuscles are dark, poorly oxygenated, and tend to disintegrate. All parts of the body are correspondingly ill nourished. The face is cachectic and sunken, the body emaciated, the limbs are feeble and seem unduly heavy. The gums become dark, bloody, relaxed, and spongy. There is an early tendency for the vitiated blood to escape from its vessels—an occurrence favored both by its thinned consistency and by the changed nutrition of the capillary walls. At first, mulberry-colored, purple spots of variable size appear on the legs, later on the body—a mere transudation of serum and blood-pigment in solution beneath the epidermis. Later, larger purple spots or diffused patches appear upon a tough, indurated, leathery base, due to effusion of blood in quantity beneath the true skin or between superficial muscles, infiltrating and coagulating in the minute interspaces of the connective tissue. Such patches are painful to touch; they may become the site of bloody blebs or of ulcers. Bloody serum often transudes into the pleural cavities, embarrassing the respiration; also into the pericardium, peritoneum, and the cavities of the joints. "Bloody flux," or dysentery, is frequent; also vomiting of blood and nose-bleed. Death occurs from exhaustion. Critical cases may rapidly change for the better, and mild cases quickly recover, when put upon supporting and vegetable diet. Onions, cabbage, radishes, horse-radish, "scurvy-grass" or spoon-wort, water-cresses—the entire class of the Cruciferae—are especially efficacious; all the vegetable acids, lemons, limes, oranges, cherries, currants, apples, are valuable. Sauerkraut is extolled by the Germans, combining vegetable food and acids. Animal broths, tonics, and regimen are essential adjuvants to this treatment. Modern improvements in sailing ships and the use of steam at sea, by shortening voyages, have tended to lessen sickness among sailors.

The improved hygiene of ships, the supply of fresh meat and vegetables prescribed by law for sailors, and the modern methods of keeping such articles hermetically sealed for long voyages, have rendered scurvy an unknown disease.

Sea'-Sickness, a nervous affection attended with nausea and convulsive vomiting, produced by the oscillations of a ship at sea. Its origin and nature are still very imperfectly known. It may attack the strong and cautious, while the debilitated and incautious go free. It may attack in calm weather and on smooth waters, while a storm and a rough sea fail to produce it. It may pass away after the lapse of a few hours, or last during a long voyage. Dr. Chapman explains it as an undue accumulation of blood in the nervous centres along the back, and especially in those segments of the spinal cord related to the stomach and the muscles concerned in vomiting, and recommends as the best remedy against it the application of ice-bags to the spinal column. In some persons its violence is prevented by small doses of opium, or by soda-water or saline draughts in the effervescent state. Champagne will alleviate, and relief is derived from nitrite of amyl, the latter in pearls which can be crushed in the handkerchief, or a few drops in a phial can be carefully inhaled.

Se'nile Pal'sy. See PARALYSIS AGITANS.

Ser'pent or Snake-bites. See VENOM.

Shin'gles (a disease). See HERPES.

Shock [O. H. Ger. *Schock*], sudden vital depression, the peculiar effect upon the animal system produced by violent injuries or violent mental emotions. It is especially a surgical term. Following serious accidents, the crushing of a limb by a railroad injury or its removal by a cannon-ball, extensive superficial burns, extensive surgical procedures, as amputations or ovariectomy, and as the result of blows over important organs, concussion of the brain, a kick or sudden blow in the region of the stomach over the solar plexus—a powerful impression is made on the nerve-centres proportionate to the extent of the superficial or peripheral nerve-irritation. Every sensation conveyed, in the state of health, from the surface to the nerve-centres, and recognized by the brain, whether as sensation of simple touch, of pain, or a special sense, as taste or smell, involves the functional activity and wear of the ganglionic or nerve-cells. A violent impression upon many superficial nerves involves sudden and violent action in the ganglionic centres. When the surface impression is extreme, the functional activity of the brain and other central ganglia is

disturbed, or may be temporarily or permanently suspended. The vital phenomena of the body—consciousness, respiration, heart-action, capillary circulation—are depressed in proportion to the shock received by the nerve-centres. The symptoms of shock are extreme pallor and coolness of the face and surface of the body, a small, feeble, slow pulse, infrequent and often irregular respiration; if conscious, the mind feeble, often unconscious, or deep coma with relaxation of the muscles. In special cases delirium, hiccough, convulsions are present. The circulation and respiration may be so depressed that death is immediate, or speedily ensues unless reaction is artificially hastened. Sensation of pain is annulled: in the gravest injury, as the laceration and removal of a limb by a cannon-ball, there may be no pain and no loss of blood during the period of shock; the period of shock, if survived, is followed by reaction, a resumption of ganglionic or central nerve-power, and revival of the dependent functions; extreme loss of blood is a prominent cause of shock, producing sudden anæmia, inanition, and disturbed action of nerve-centres. The depressing after-effect of the inhalation of chloroform and ether, and of alcoholic excess, is sometimes spoken of as shock, but with doubtful propriety. The influence of great mental excitement or depression in causing shock is undoubted. The sight of blood causes many to faint. Fright, terror, sudden sorrow have caused the hair to turn white in a night—have produced delirium, convulsions, incurable epilepsy, dementia, permanent nervous prostration, and death. No satisfactory lesion or organic change has been found to explain shock, as when autopsies have been performed following sudden death by lightning or blows over the solar plexus. The treatment of shock is to be directed to the immediate development of reaction. The sinking pulse must be rallied by ammonia and alcohol, by stimulating enemata, heat to the extremities and surface. Counter-irritants to the extremities, epigastrium, and occiput aid to equalize capillary circulation. The galvano-electric poles to the region of the medulla and diaphragm may facilitate respiration. In mild cases of shock external warmth, a little diffusible stimulant, and rest are all that is required.

Sight, Defects of. Defects of sight are due either to (1) errors of refraction, (2) opacities of the refractive media, (3) lesions of the optic nerve, retina, or choroid, or (4) continued exclusion of the eye from visual purposes.

(1) In the lesser degrees of deviation from the normal condition of refraction (emmet-

tropia) the vision can generally be raised to the normal standard by the use of suitable glasses, but in very high degrees of ametropia the sight can rarely be raised to over one-half or two-thirds the normal. In high degrees of myopia and myopic astigmatism there is usually an affection of the choroid (staphyloma posticum), which increases the area of Mariotte's "blind spot," and, when extensive, encroaches upon the region of the macula and interferes very seriously with the acuity of the sight. In high degrees of hypermetropia and of hypermetropic and mixed astigmatism all objects are seen under large circles of dispersion, and hence with great indistinctness. The eyes are thus, under the influence of prolonged bad vision, so affected that they do not, even when an existing refractive error has been corrected, at once exhibit the expected sharpness of vision. In young subjects this defect often passes away quickly under exercise of the organs with the correcting lens. It is difficult, and often impossible, to correct with glasses those defects of vision arising from irregular astigmatism.

(2) Serious defects of sight may arise from opacities of the cornea so slight that they can only be perceived by the aid of the ophthalmoscope or of a powerful convex lens. In the other extreme the cornea may be entirely opaque, thus reducing the vision to bare perception of light. Where the pupil is covered with opaque cornea, and another part of the cornea is transparent, vision is often in a great measure restored by making an artificial pupil immediately behind the clear portion of the cornea. The deformity produced by opacity of the cornea is sometimes removed by tattooing the white spot with India-ink.

Next we have opacities of the crystalline lens and its capsule. An infrequent form of opacity of the anterior capsule is the unabsorbed remains of the pupillary membrane of foetal life. This usually consists of one or more filaments of opaque tissue stretched from the pupillary border of the iris to a point of attachment near the centre of the anterior capsule. Opacities of the lens constitute what is known as cataract. This, like nearly all other affections of the eye causing defects of sight, may be either congenital or acquired. It may be the result of a blow upon the eye, or of diabetes, or of the general breaking down of the system, and consequent mal-nutrition of the lens, due to old age. Whatever may be its cause, it can in no case be removed except by surgical operation.

Opacities of the vitreous may be due to hæmorrhage from the retinal or choroidal vessels, and the consequent mingling of blood

with the vitreous humor, or to inflammatory or degenerative changes in the humor itself. A curious form of vitreous opacity is produced by the formation of numerous crystals of cholesterine in that fluid, presenting a brilliant ophthalmoscopic picture, like a shower of sparkling meteors.

(3) Inflammation or atrophy of the optic nerve, or of either of the coats forming the back wall of the eye, separation of the retina from the choroid, tumors of the optic nerve and retina, hæmorrhage into the substance of the retina, all produce grave defects of vision, and can be diagnosticated only by means of the ophthalmoscope.

(4) In cases of squint of one eye, either convergent or divergent, the image of the object formed upon the retina of the deviating eye is almost always involuntarily suppressed. Thus the eye is excluded from vision, and gradually loses the power of performing its function, as would be the case with any other unused organ. When such an eye has been restored by operation to parallelism with its fellow, the visual power not unfrequently increases to a marked degree. In alternating squint, where the individual sees first with one eye and then with the other, the sight remains good in both eyes. Hence in these cases there is not the same urgent necessity for an early operation. In cases where one eye is emmetropic and the other very hypermetropic, more or less impairment of vision of the latter usually occurs. This, if it has not gone too far, may often be remedied by daily and regular exercise of the amblyopic eye with a glass correcting the refraction, the perfect eye being temporarily excluded. Cases occasionally come under observation where it is impossible to detect any cause for the defect, which may range from a slight impairment of vision to total blindness. Ophthalmologists not very infrequently meet with cases in which defective vision of one eye had existed for many years before it was accidentally discovered.

Skin Diseases. The human skin is subject to the same morbid processes to which other organs of the body are. The diseases appear as primary or secondary eruptions, the former being immediate products of the morbid processes, the latter produced by further development or changes of the primary eruptions. Primary forms are—(1) *The macule or spot*, a change of the normal color of the skin without elevation, not uniformly distributed over the surface, arising from hyperæmia, hæmorrhage, or inflammation, sometimes from anomalies of the distribution of the coloring granules of the skin, the pigmentum. More or less uniform changes of the color of the surface are

termed *discolorations*. (2) The *papule* or *pimple*, a projection above the surface, varying in size between a millet-seed and a lentil, produced by diseases of the cutaneous glands, inflammation, and new growths of the papillary layer. (3) The *tubercle*, a solid projection of the size of a lentil up to that of a hazelnut. (4) The *wheel* is slightly raised above the surface, and greatly exceeds the thickness in horizontal extension, varying in size from that of a finger-nail to that of the palm of the hand. (5) The *tumor* forms a solid projection of the size of a walnut to that of a man's fist. (6) *Vesicles* are elevations of the epithelial layer of the skin produced by a transparent or milky fluid, corresponding in size to that of papules, and as such never being of a long duration; while (7) *blebs* surpass the size of vesicles up to that of a goose's egg, and (8) *pustules* always contain pus, and therefore form superficial abscesses of the skin. Vesicles, blebs, and pustules almost always are surrounded by inflammatory areas.

Secondary forms of eruptions are—(1) The *excoriation*, a flat abrasion of the epithelial layer of the skin, arising from destruction and rupture of primary eruptions, very often through scratching with the finger-nails. They always heal without the formation of a scar. (2) The *ulcer* presents a loss of substance penetrating into the derma, which heals slowly and with formation of a cicatrix. (3) *Fissures* are elongated cracks in the skin on parts liable to much stretching. (4) *Scales* are produced by detached epidermis. (5) *Crusts* result from drying of an exuded fluid or of extravasated blood. If the scales or crusts or the sebaceous secretion be placed one over the other in strata, they are termed (6) *lamellated crusts*. (7) *Scars* or *cicatrices* are connective-tissue formations, which replace deeper losses of substance of the derma.

The causes of diseases of the skin are either rooted in the whole organism, or they are local ones, by which the skin is primarily or chiefly attacked; hence the division into *symptomatic* and *idiopathic* affections of the skin. There exist eruptions on the general covering which are intimately connected with and caused by diseases of the whole organism, such as in variola, scarlet fever, measles, syphilis. Certain rashes occur in typhoid fever, in purulent infection of the blood, so-called pyæmia, in scrofulosis, scorbutus, etc. Moreover, diseases of internal organs may involve the skin, especially affections of the intestinal tract, of the liver and spleen, of the internal genital organs, of the urinary apparatus, of the nerve-centres. There are, lastly, normal processes—the dentition, menstruation, pregnancy—

which lead to various kinds of cutaneous affections. Hereditary transmission is of a doubtless influence in causing skin diseases (syphilis, psoriasis, leprosy, etc.); furthermore, the age, the business, the mode of life, and climate. But the most potent agencies for producing affections of the skin are those external to the body, attacking the skin directly. Besides general injurious influences—heat and cold, dryness and moisture, different arts and trades—merely local diseases are caused by the operation of caustic substances, neglect of cleanliness or exaggerated washing and rubbing with strong kinds of soap, long-continued pressure upon certain parts, and parasitic organisms which penetrate the skin. The scratching of the patient himself who suffers from itching is an important cause for producing mechanically lesions of the skin. Thus, parasites give rise to such affections by irritating the skin directly or by exciting the sensibility of the cutaneous nerves by producing the sensation of itching. Besides the vegetable parasites, living within the skin, *Trichophyton*, *Microsporon*, *Achorion*, and *Oidium*, there exist animals which dwell within the tissues of the skin—the itch-insect (*Acarus scabiei*), the pimple-mite (*A. folliculorum*), the sand-flea (*Pulex penetrans*), the Guinea-worm, the harvest-bug—or merely seek their food upon the skin's surface, such as the different kinds of lice, the flea, the bed-bug, the mosquitoes, and gnats.

With regard to these causing agencies of skin diseases the treatment will either be a universal or a merely local one. If we succeed in removing the cause of the disease, perfect cure is possible, especially of affections produced by local injurious agencies, parasites, external irritations, and the like. Skin diseases rooting in the general constitution need a general treatment, either surgical or internal. There exist many skin diseases which can be radically cured, while other ones can be removed temporarily only, without the view of radical cure; and still other ones are incurable. Many diseases run their course without any treatment, or their course cannot be modified by the physician; in these diseases, therefore, the indifferent treatment is attended with the best results. The treatment of certain skin diseases varies, however, greatly, depending upon the views about their causation; thus, very often internal remedies are given unnecessarily where mere local treatment is sufficient to cure a skin disease.

In considering the different varieties of affections of the skin, we propose to follow in all essential points the classification adopted by the Vienna school, the champion of which is Hebra. His experience,

together with an unprejudiced mind, led him to doctrines more in accordance with clinical observation than those of other dermatologists of either the past or the present time. The changes of the skin, by too great an afflux of blood (hyperæmia) or lack of blood (anæmia), as such do not produce diseases of their own, being always of a transient character or rooted in diseases of the whole organism. We therefore omit their consideration.

1. *Diseases due to Perverted States of the Secretions of the Cutaneous Glands.*—The sweat-glands of the skin produce a fluid, the perspiration, which contains 99.3–99.5 per cent. of water, the residue consisting of solid matters, among which are chloride of sodium, phosphate of lime, hydrochlorate of ammonia, and traces of iron and of fatty matters. Even in the normal state each individual diffuses around him a special odor. There are persons with a peculiar rancid odor of their perspiration, a disease called *bromidrosis*, either universal or local—for instance, lasting in the armpits, on the feet—in spite of the most scrupulous cleanliness. This disease is always dependent on too copious perspiration (*hyperhidrosis*), and curable by repeated treatment with diachylon ointment. The secretion of a colored perspiration is termed *chromidrosis*. The sebaceous glands, which secrete a fatty mass, may produce the sebum in excessive quantity, there being no impediment to its secretion—the so-called *seborrhœa*. The disease is very common on the scalp (dandruff), and always leads to loss of the hair. It yields readily to certain preparations of tar, and a new growth of hair can very often be obtained. If, on the contrary, the excretion of the sebaceous mass be interfered with, the result is its accumulation within the glands or their ducts, the so-called “flesh-worms”—*comedones*. In the mass of a flesh-worm there is often found an insect, the *Acarus folliculorum*. The flesh-worms, again, are the most common causes of pimples, as they act upon their neighborhood like foreign bodies. Hardened flesh-worms are termed *milium*. Sometimes the sebaceous glands become very much enlarged, giving rise to appearance of tumors, *atheroma*, which if pedunculated are termed *molluscum*, but are not contagious at all. Too scanty production of sebaceous matter leads to brittleness and desquamation of the epidermis—*pityriasis simplex* and *xerosis*.

2. *Diseases due to Inflammation.*—Inflammatory affections of the skin either terminate within a short period of time, with a definite duration, these being called *acute*, or the development and involution of the eruption take place less quickly, the inflammation

being of a longer duration from repeated relapses—*chronic inflammatory processes*. The acute inflammations, again, are either caused by contagion, and themselves generate an infectious matter, or they do not owe their origin to contagion nor develop it during their course. The *acute contagious inflammations*, so-called *exanthemata*, are due to diseases which attack the whole organism, are attended with febrile symptoms, present certain definite appearances on the surface of the body, and run a course the duration of which can be computed beforehand. In these diseases—*measles*, *scarlet fever*, and *smallpox*—the sympathy of the entire organism is manifested by symptoms of various kinds, both while the rash is present and also after its disappearance. They therefore cannot be regarded as mere skin diseases. The *acute, non-contagious inflammations* have a definite typical course, as their symptoms succeed one another in regular order. If the inflammation be manifested mainly by redness, with a slight exudation of the fluid part of the blood, fugitive rashes are produced, which when spread over large parts of the surface and do not produce the sensation of itching, are termed *erythema*, but when presenting isolated red spots are termed *roseola*. Extended and isolated superficial inflammations, accompanied with stinging or itching sensation, receive the name of *urticaria*, the latter being always characterized by the development of wheals. Diseases of this kind often are produced by disturbances of the stomach or by local irritations of the skin—for instance, by certain coloring-matters of cloths, stockings, etc.—and accompanied by fever. They usually disappear after a short period of time without special treatment, but are very liable to recurrences. To the group of acute, non-contagious inflammations belong all diseases produced mechanically or by poisons, by too high or too low a temperature; furthermore, the *erysipelas* and *furuncles*. The difference in the anatomical characters depends on the extent, the penetration into the depth, and the termination of the inflammation. Lastly, there exist acute inflammations with accumulation of fluid beneath the epidermis, leading to the formation of vesicles and blebs, with short duration and no liability to return. In this group we enumerate the *herpes* (hives) and *milïaria*. The *herpes zoster* (shingles) is the most important of the forms of herpes, it being more extensive and the number of groups of vesicles much larger than in common forms of hives. The seat of shingles always corresponds to the distribution of certain cutaneous nerves; they almost always are confined to one-half of

the body, and always accompanied with intense pains. Shingles attack the individual, in most instances, only once in the life; unfortunately, very little can be done for the relief of the pains. *The chronic inflammations* are characterized by a tendency to repeated relapses and the protracted course which they run. One group of these diseases is formed by eruptions which manifest themselves by a superficial redness and slight swelling, affecting principally the papillæ of the derma, and are attended with an excessive production of epidermis, but only with trifling sensations of itching, tension, or pain. Such are *psoriasis*, *lichen*, and *pityriasis rubra*. *Psoriasis* is a very common disease, characterized by white, rough, uneven epidermical patches on a dark-red ground, dispersed all over the body, mainly on the elbow and knee joints. The patches are not liable to any further change, such as suppuration and ulceration; they leave no scars, though they are sometimes followed by persistent pigmentation. Sensations of pricking or itching are complained of only when the patches first come out; afterward there are no subjective symptoms. The disease occurs almost only on otherwise healthy and strong individuals. It is, however, harmless, but very liable to recur after it has been removed by local caustic and tar applications, together with internal administration of arsenic, carbolic acid, etc.

A second group of inflammatory skin affections is characterized by intense itching, and besides the primary form of eruption they irresistibly provoke scratching in consequence of the itching; this, again, gives rise to those further changes in the skin which are known under the name of excoriations. To this group belongs a very common disease termed *eczema*, and a rare disease termed *prurigo*. The *eczema* (moist tetter or salt rheum) is a skin disease of usually chronic course, characterized either by the formation of aggregated papules and vesicles, or by more or less deeply-red patches covered with thin scales, or in other cases by a moist surface; while in any of these forms there may be developed in addition partly yellow and gummy, partly green or brown, crusts. The different stages of one and the same malady are therefore—papular, vesicular, squamous, weeping, and crustous *eczema*. The disease rarely turns into a dangerous one, but is very troublesome on account of great itching and the consequences of scratching. It is curable in every stage—by indifferent remedies when acute; by ointments, especially the diachylon and zinc ointment, when weeping; by tar preparations when scaly; and caustics when chronic and having led to hardening (so-

called hypertrophy), of the skin. Internal remedies almost always are useless.

A third group of chronic inflammatory skin diseases embraces those pimply and pustular affections which arise from inflammation of the hair-sacs and sebaceous glands. They are recognized as forms of *acne*, and distinguished into *dispersed acne*, *sycosis*, and *acne rosacea*. The dispersed acne on the face, the chest, and the back—one of the most disfiguring diseases—is always produced by accumulation of sebaceous masses in the glands (flesh-worms), and is entirely curable by repeated emptying of the glands and irritating agencies, without internal treatment. Analogons are the cause and the treatment of *acne rosacea*, which produces the most common forms of red nose. Even this disease is, if not neglected too much, entirely curable. The healing of *sycosis* (barber's itch) can be obtained by application of diachylon ointment, repeated shaving and pulling of the hairs, in the sheaths and follicles of which the inflammation is mainly situated.

To the fourth group of chronic inflammations belong the eruptions in shape of blebs, termed *pemphigus*, an incurable disease. Chronic inflammations of the skin of very variable but characteristic forms are produced by a general disease, *sypilis*; here the skin is merely symptomatically attacked, besides different other organs. With traumatic lesions of the skin, as well as with its inflammatory diseases, very often *hæmorrhage*, escape of blood from the vessels into the tissues, is combined. *Hæmorrhage* is furthermore a symptom of universal disease in *scorbutus*, in *purpura rheumatica*, and *morbus maculosus*.

3. *Diseases due to Hypertrophy*.—Too copious production of any tissue of the skin may be a consequence of a chronic inflammatory process, or it may occur without the symptoms of irritation as a consequence of anomalous congenital productivity. The *corn* and the *tyloma*, for instance, are products of a long-continued local irritation of the skin, but we know of instances in which tyloma, the hardening and hypertrophy of the skin of the palms and the soles, must be considered as a congenital disease. The *elephantiasis arabum*, an immense hypertrophy of all constituting tissues of the skin, is doubtlessly due to chronic inflammation of the lymphatics; while *ichthyosis*, the exuberant growth of epidermis, is due to the congenital hypertrophy of the papillæ. *Warts* and *papillary growths* of the skin may be produced by either kind—local irritation as well as anomalous function of papillæ. *Horns* of the skin, hypertrophy of the nails and the hairs—*polytrichia*—always are dependent

on congenital anomalies in the formation of the tissues of the skin. The pigment-granules of the rete mucosum are very often hypertrophied, leading to formation of brown spots, *ephelides* (freckles), *chloasma* (liver-spots), while long-continued irritation of the skin leads to universal dark discoloration—*melasma*.

4. *Diseases due to Atrophy* are based on the same principles as the too copious formation of certain parts of the skin—hypertrophy. Inflammation often produces first hypertrophy, afterward ulceration, loss of substance, and atrophy. *Leprosy*, *lupus*, and *scleroderma* are instances of such combined diseases. In leprosy tumors first appear, which subsequently shrink or ulcerate, or the shrinkage is the immediate symptom of the disease—*morpheus*; here the decreased sensibility of the attacked parts is one of the main symptoms. All these diseases lead to secondary ulceration, loss of parts of the skin, even parts of the body. The treatment is only in *lupus* successful, but even here not invariably. Hypertrophy of the pigmentum is not rarely combined with its partial atrophy in *vitiligo*, *leukopathia*, etc. Merely to atrophy are due the senile changes of the skin, the white color of the hairs, the early falling out of the hairs without visible cause, the localized atrophy of hairs in *alopecia areata*. A plain atrophy is also the *xeroderma*. But very little can be done with regard to the cure of these diseases.

5. *Diseases due to New Growths*.—New growths or tumors either belong to the connective-tissue formations of the skin, the derma, or they are products of an anomalous epithelial growth. Tumors of the former kind may be benign or innocent—viz. painless, not ulcerating, not recurring after extirpation, and not infecting the organism, such as *fibroma*, a variety of which is the formation of scars without preceding lesion, the so-called *cheloid*; furthermore, *papilloma*, growth of the papillary layer, embracing most of the *warts* and *navi*; lastly, *angioma*, erectile tumors produced by copious new formation of blood-vessels. Or the connective-tissue tumors are malignant—viz. painful, ulcerating, producing new growths around the first-formed tumor, and easily recurring after extirpation, even leading to secondary formations of identical tumors in the lungs, the liver, etc., such as *sarcoma*, one variety of which, the *pigmented* or *melanotic sarcoma*, forms the most malignant kind of tumors of the organism. Cancer is considered to be essentially an epithelial formation, which always is malignant. In all tumors the radical extirpation is the only reliable means of curing the disease, very often of saving the life of the patient.

6. *Diseases due to Anomalies of Innervation*—*Neuroses*.—Many of the already-named diseases of the skin can be looked upon as being disturbances of the nerves in the first instance (*urticaria*, *herpes zoster*, *leprosy*, *atrophy of pigment*). Besides, we know disturbances in the property of sensation of the skin, lowered sensibility—*anæsthesia*—and excited sensibility—*hyperæsthesia*. To the latter kind belongs the itching of old persons, *pruritus senilis*, which malady often is treated successfully by internal administration of carbolic acid.

7. *Diseases due to Parasites*.—The *scabies* is produced by the presence of the itch-insect within the epidermis. It begins with development of small vesicles, mostly on the skin of the hands, especially that between the fingers, these places being the most exposed to invasion of the insect. The eruption is accompanied with severe itching, which compels the patient to scratch. By simply scratching a certain length of time, all symptoms of *eczema* arise, even boils and furuncles. The disease is readily curable by local application or preparations of sulphur. Analogous is the action of the flea, the bed-bug, the louse. By vegetable parasites are produced slightly-scaling and itching brown spots, *pityriasis versicolor*; furthermore, *herpes tonsurans* (ring-worm), a very common disease, appearing first in the shape of small vesicles or ring-like red eruptions, which, when situated on the parts provided with hairs, lead to baldness; lastly, *favus*, a disease kindred to ring-worm. If we succeed in killing the parasites locally, a perfect cure can be obtained in a short period of time, but on the scalp and the beard these diseases usually are very obstinate. (See special articles on skin diseases, BARBER'S ITCH, BOIL, BURNS, and SCALDS, CHICKEN-POX, CORNS, ECZEMA, ELEPHANTIASIS, ERYSIPELAS, HERPES, ICHTHYOSIS, ITCH, LEPROSY, LUPUS, NETTLE RASH, RASH, RINGWORM, RUPIA, SCABIES, SCALD HEAD, SCURVY, WARTS.)

Small-pox, or *Vari'ola*, is the most important of the group of acute general contagious diseases known as the *exanthematous fevers*, since, when not controlled by vaccination, it is the most fatal of them all. It is said to have prevailed in Eastern countries from the most remote antiquity, but its early history is shrouded in obscurity. Aaron or Ahroon, an Alexandrian priest, who lived in the early part of the seventh century, is said to have first described the disease in an extinct work entitled *Pandects of Medicine*. Some have traced an allusion to it in certain passages of the Old Testament, as, for instance, Moses' record of "the plague of boils and blains." The Greek writers included

smallpox and measles under the term *λοιμική*. The Latin word *variola*, now generally employed by medical writers, is said to have been first used by Constantinus Africanus in the eleventh century. The first appearance of smallpox in Europe is supposed by some to have been the epidemic *cum pusulis et vesicis, quæ multum populum affecerunt morte*, described by Gregory de Tours as having prevailed in France in the reign of King Childebert about the year 520; it is more generally considered, however, that the disease was first brought to Europe by the Saracens about the year 710. Spreading from Spain, it soon overran Europe, but spared for a time certain isolated countries, such as Denmark, where it first appeared in 1527. It was carried to the West Indies in 1517 by the adventurers who hastened to profit by Columbus's discovery of the New World. It reached Mexico in 1520, and Brazil in 1563. Farther north it first appeared in Maryland, having been brought there by an English ship in the early part of the seventeenth century. Thence it rapidly spread through Virginia, the Carolinas, New England, and other portions of the colonies.

Up to the beginning of the present century, when its ravages were decidedly checked by VACCINATION (which see), it continued its course as a deadly pestilence almost always and everywhere present, sparing no age, sex, condition, or nationality, no one being safe from it except by virtue of having already passed through its perils. Its history, like that of the other acute contagious diseases, is that, while always prevailing to a certain extent, especially in large cities, it rages as an epidemic every few years. This periodical recurrence of epidemics is doubtless chiefly due to the fact that each epidemic exhausts nearly all the subjects susceptible to the disease, so that a certain time has to elapse for a sufficient number of others to be born into the world to afford the material for a fresh outbreak. The last great epidemic of smallpox began in 1870, overrunning all Europe and North America, and abated in 1873.

Of the original cause of smallpox we know nothing, but we do know that it now never occurs save as the consequence of infection conveyed from one person to another. The contagion exceeds in virulence that of any other disease. The infectious principle is known to reside in the fluid contents of the pocks and in the crusts resulting from their desiccation, and it is probable that it is also contained in many if not all of the fluids of the body. Moreover, it pervades the emanations from the person, so that actual contact with the sick is not necessary to the conveyance of the disease. To what

distance the volatile contagium may extend is uncertain, but it is known to have crossed a river 1500 feet wide. In its fixed condition, attached to articles of clothing, bedding, merchandise, mail-matter, paper-money, etc., it is very energetic and persistent. The disease is communicable at all periods of its course, even in the period of incubation, before any symptoms have occurred, and as late as the close of the stage of decrustation; but probably it is most intensely contagious during the vesicular stage of the eruption. Even the dead body is capable of conveying the infection. It may also be carried from one person to another without the person who carries it himself suffering an attack. This is termed "mediate contagion." It is reasonably certain that the prevalence of the disease is more or less influenced by the season of the year, and perhaps by the state of the weather, but the effects of these differ in different countries and in different years, so that the precise part which they play in the production of epidemics can scarcely be stated.

Very few persons (certainly not more than five in every hundred) are naturally and permanently insusceptible to smallpox, and very few are even temporarily insusceptible, except from having already had the disease or from having been vaccinated. Very young infants have been supposed to be rather insusceptible to the infectious diseases, yet it is among children, including very young ones, that smallpox makes its greatest havoc, and it is by no means rare for it to attack the unborn child. One attack of the disease generally exempts the affected person from subsequent attacks, but in exceptional cases second attacks do occur, and even fifth and sixth attacks have been recorded. The immunity conferred by vaccination is almost as complete as that which results from having had the disease.

On contracting the smallpox contagion the individual shows no signs of the disease until after the lapse of a *period of incubation*, which generally lasts thirteen days. It is occasionally a few days shorter, especially in persons who have been vaccinated, and in the case of inoculated smallpox it is remarkably abridged, the local phenomena resulting from the inoculation being observed to begin in two or three days. The *initial stage* is usually ushered in by a violent chill or by repeated slighter chills, followed by high fever, weakness, vomiting, severe headache, and pain in the back. Delirium is frequently observed, and in children convulsions or coma. This stage lasts from two to four (usually three) days, and death may occur before its termination. A preliminary rash—commonly of a roseo-

lous character—is sometimes observed during the initial stage. This is of some value from a prognostic point of view, but must not be confounded with the essential rash which marks the *eruptive stage*. Little red elevations of the skin (somewhat pale at first) appear upon the face and head, and a few hours afterward upon the back, breast, arms, abdomen, legs, and feet. These elevations vary in size from that of a millet-seed to that of a pin-head. They are often more plainly to be felt than seen. They are usually the most numerous on the face. On the second day after their appearance (fifth day of the disease) they have increased in size, constituting distinct papules, and are of a darker hue. On the third day (sixth of the disease) they are more conical, and each papule shows at its summit a minute vesicle containing a clear, lymph fluid. These vesicles encroach more and more upon the area of the papule from day to day, the remains of the latter being visible as a delicate red line surrounding the vesicle. The vesicle itself is flattened, circular, of a pearly-white color, and very frequently depressed at the centre (“umbilicated”). By the seventh or eighth day (tenth or eleventh of the disease) it has reached the size of a split pea, and, the central depression being effaced, is nearly hemispherical in shape. On the outbreak of the eruption, or soon afterward, the fever disappears or moderates for the time being, according to the severity of the case; but about the sixth day of the eruption (ninth of the disease) the contents of the vesicle, which have gradually been growing opaque, become completely changed into pus. In other words, the vesicle becomes a pustule, the red line or halo surrounding it becomes increased in breadth, and the *stage of suppuration* or *maturation* begins. In mild cases this stage is accompanied by little or no fever, but in severe cases of confluent small-pox the *secondary fever* is generally well marked, being sometimes announced by a chill or chills, and lasting from three to six or eight days, according to the severity of the case. With the renewal of fever there is a return of headache, nervous disturbances, such as delirium, etc.; the skin becomes enormously swollen, so that the countenance is frightfully disfigured, and the pustules are exquisitely painful, especially upon the face, the hands, and the feet. At this time the formation of boils is quite common, and numerous complications are apt to occur, such as erysipelas, diffuse inflammation of the cellular tissue, pyæmia, gangrene, affections of the organs of special sense, pleurisy and other inflammatory diseases of the respiratory apparatus, affections

of the heart and great vessels, and occasionally abdominal inflammations. About the eleventh or twelfth day of the eruption (fourteenth or fifteenth of the disease) the pustules begin to dry up, which process characterizes the *stage of desiccation*. The general and local symptoms now gradually abate, and the pustules, beginning generally with those on the face, dry into hard, dark-brown crusts. Preceding this occurrence, a yellowish, gum-like exudation frequently takes place upon the surface of the pustules, especially if they have been ruptured, and concretes into a rough, brittle coating overlying the darker and firmer crusts. During the stage of maturation and the earlier portion of that of desiccation the patient's body exhales a peculiar and repulsive odor, which, together with his frightful appearance, makes him an object of horror as well as of pity. The process of incrustation is often accompanied by intolerable itching, and by scratching the course is so interfered with that secondary and tertiary crusts often form; and this fact, as well as the varying severity of the cutaneous lesions, makes the period of decrustation somewhat variable. After the crusts have fallen off, the sites of their former attachment remain visible for a considerable time in the form of red and somewhat elevated spots, giving the patient a peculiar mottled appearance. In course of time the redness and swelling disappear without leaving any permanent marks, or else (in case the pocks have involved the papillary layer of the skin) the spots become whiter than the surrounding skin, radiated and depressed scars remaining for life. The individual is then said to be pock-marked.

As to the *structure of the pock* (vesicle or pustule), it is not a mere tent-like elevation of the cuticle from distension by a subjacent fluid, but the inflammation begins in the lower layers of the epidermis (the *rete Malpighii*), and soon results in the exudation of fluid *into the substance* of that portion of the skin, separating its cells and forming a multilocular swelling. Hence it is that, on puncturing the vesicle, only a small portion of its contents escapes, the fluid being contained in a number of separate compartments. Along with these changes in the epidermis (and perhaps preceding them, and therefore more essential) the subjacent papillæ of the derma, and even the fibrous corium, become hyperæmic and subsequently infiltrated. In so-called “diphtheritic” pocks the bases of the papillæ are so swollen and gorged with blood that their summits become strangulated, as it were, and die. These dead and bloodless heads of the affected papillæ form

a white, pultaceous mass upon the floor of the pock—the “false membrane” of the older writers. Its formation is always followed by pitting. The umbilication of the pock is, as regards the mode of its production, still a matter of dispute. Many have supposed it to be due to a bridle-like action of that portion of the epidermis which dips down to form the lining of a sebaceous or sudoriparous follicle, and they assume that such a follicle constitutes the usual centre of a pock. Others attribute it to the early commencement of desiccation at the centre of the pock while yet the exudation is increasing at the border. In the vesicular stage of the pock the contents consist of a clear, viscid, albuminous fluid (lymph), containing epithelial debris, leucocytes, and very minute globular bodies, about $\frac{1}{30000}$ th of an inch in diameter, termed microspheres, microzymes, etc. (also falsely called bacteria). It is probable that these latter bodies are, *par excellence*, the bearers of the contagium. They are supposed to be of a fungous nature, but attempts at their cultivation have resulted in nothing satisfactory. The crust includes the “false membrane” already mentioned, and occasionally a portion of sloughy tissue from the corium, or the subcutaneous layer of cellular tissue, is found attached to it.

Numerous *varieties* of smallpox are spoken of by writers. In the first place, we have the *discrete* and the *confluent* forms. In the former the pocks are separate and distinct from each other, the secondary fever is mild or altogether wanting, and, except for complications, the disease is not specially dangerous. The latter, as its name implies, is characterized by a running together of the pocks, and is always severe and frequently fatal. Semi-confluent eruptions show appearances midway between those of the discrete and the confluent, and betoken a corresponding severity of the disease. In *corymbose* smallpox the pocks are aggregated in clusters or in a single cluster, the eruption being elsewhere discrete. This form is rare and very dangerous. *Malignant* smallpox (black or hæmorrhagic smallpox) is characterized by the early occurrence of blood-poisoning, resulting in effusions of blood into the pocks and into the substance of the organs and tissues of the body, and in hæmorrhages from the mucous surfaces. It may prove fatal before the eruption has had time to appear. Such cases have been called *purpura variolosa*. *Benign* smallpox (*variola verrucosa*, or *cornea*, stone-pock, horn-pock, or wart-pock) is of occasional occurrence. It is exceptionally mild, although the primary fever may be severe. The pocks are abortive, and there is no secondary fever and no pitting. Small-

pox *without eruption* (*variola sine exanthemate*, the *febris variolosa* of Sydenham) is of rare occurrence. The whole process consists of the primary fever. *Varioloid* is smallpox mitigated by previous vaccination. The initial fever may be severe, but the eruption is moderate, many of the pocks shrivel early, and there is no secondary fever.

In regard to the *sequelæ* or after-effects of smallpox, it may first be stated that it is capable of rousing into activity any dormant diathesis or morbid tendency, such as the scrofulous, tubercular, syphilitic, etc. Some have supposed that an attack of smallpox had a tendency to improve the general health; but not only is there no foundation for this opinion, the very reverse is the case. Ophthalmia, blindness, chronic ulcers, enlargements of the lymphatic glands, inflammation of the ear, boils or abscesses, cancrum oris, pestilential bubo and carbuncle, laryngitis, salivation, dropsy, necrosis, and many other affections have been known to follow the disease, apparently owing their origin to its occurrence.

The *post-mortem appearances* in smallpox, besides the results of inflammatory complications, consist mainly in degenerative changes in the organs, especially the liver, the kidneys, and the spleen, and hæmorrhagic effusions. On the mucous membranes, particularly near the natural openings of the body, pocks are found essentially like those on the skin. In the trachea they extend down to its bifurcation, and sometimes into the bronchi of the second and third orders. The brain and spinal cord are sometimes congested and œdematous, but generally healthy.

The *diagnosis* of smallpox is easy in cases where the eruption is well advanced, but in the earlier stages, as well as in sporadic cases and modified forms, it is often difficult, and sometimes impossible. It is most apt to be confounded with measles, chicken-pox, pustular syphilides, acne, and lichen among skin affections, and with typhus, relapsing fever, pneumonia, meningitis, and several other acute inflammatory diseases. Too much reliance should not be placed upon the appearance of the eruption, particularly in its earlier stages. The initial fever of smallpox is usually productive of a higher temperature than is that of measles (105° F. or over in the former, and from 102° to 104° F. in the latter); and in measles the catarrhal symptoms occur earlier than in smallpox. In chicken-pox there is little or no premonitory fever, and, if there be any, it lasts only twenty-four hours before the eruption appears, and the latter is more superficially situated and more rapidly developed than

that of smallpox. Syphilitic eruptions and acne cause little or no fever, and can only be mistaken for smallpox by a too exclusive attention to the cutaneous appearances. Febrile lichen may for a short time be confounded with smallpox, but the eruption occurs after only one day's illness, appears on various parts of the body indifferently, and does not advance beyond the formation of papules. The preliminary roseola of smallpox often resembles the rash of scarlet fever, but its localization, together with the absence of the marked throat symptoms of the latter disease, will serve to distinguish it. The early diagnosis of smallpox from exanthematic typhus is often very difficult. In the former disease, however, the temperature falls on the appearance of the rash, but does not in the latter. The appearance of the eruption will distinguish variola from the first attack of relapsing fever. The acute inflammations are to be distinguished by a close attention to the local symptoms proper to them, and by the non-occurrence of eruption.

The mortality of smallpox varies in different epidemics, ranging in unmodified cases from 15 to 50 per cent. Of 46 hæmorrhagic cases observed by Curschmann, all proved fatal, while 235 cases of unmodified variola (including the 46 hæmorrhagic cases) resulted in 99 deaths—a mortality of over 42 per cent. Marson, of the London Smallpox Hospital, records 1838 cases of confluent smallpox, with 937 deaths (50 per cent.), 614 semi-confluent cases, with 51 deaths (8 per cent.), and 202 discrete cases, with 8 deaths (4 per cent.). Of 4896 cases of smallpox after vaccination (including good, bad, and indifferent vaccination), Marson saw death result from smallpox alone in 316 cases (6.56 per cent.). Confluent smallpox, even if the eruption be confluent only on the face and discrete elsewhere, often proves fatal. Certain abnormal conditions of the pocks—a flat, white, and pasty appearance, with claret-colored areolæ on the limbs—are of ill omen. Young children and aged persons are particularly apt to die if attacked by the disease. Symptoms of blood-poisoning or of a severe implication of the nervous system, as well as affections of the air-passages, are of bad import. Pregnant and lying-in women are in very great peril from smallpox. In the former abortion usually precedes death. Drunkards also are very apt to die. Robust and healthy persons, in good hygienic circumstances, are much more apt to recover than are those of the opposite description. Death may take place at any period of the disease, but is most common during the secondary fever.

The *treatment* of smallpox consists in hus-

banding the resources of the patient, and in early detecting and combating complications. No sort of medication or regimen exerts any curative effect in the proper sense of the word. Many so-called specifics have been vaunted, but there is no satisfactory proof that they have ever accomplished anything. Vaccination, although of such signal efficacy in *preventing* smallpox, is utterly powerless to cure it; and it has not been shown that vaccination of a person already suffering from smallpox can even ameliorate the disease, whether done in the ordinary way or by the subcutaneous injection of vaccine lymph. No treatment will prevent pitting.

The *prevention* of smallpox may be almost certainly accomplished by thorough VACCINATION (which see). Avoidance of exposure to the contagion will also, of course, prevent the disease, but this is difficult, and often impossible, to manage. Smallpox patients should always be isolated, and the funerals of those who die should be strictly private. All clothing, bedding, etc. which may have become infected should be destroyed by fire, or, if too valuable to be sacrificed, it should be disinfected by heat (as high as 212° F.) or by the fumes of burning brimstone. Every one exposed to the disease should be at once revaccinated. Patients are capable of conveying the infection until all the crusts have fallen off.

Snake-Bites. See VENOM.

Spasm [Gr. *σπασμός*, from *σπᾶω*, to "draw or stretch"], sudden and involuntary muscular contraction. The relaxation and tension of muscular tissue are dependent on nerve-force. Spasm of muscle may result from disturbance of the nerve-centres, from peripheral irritation of the affected part, or from irritation of other organs or surfaces, reflected from the nerve-centres. When spasmodic rigidity is persistent for any length of time, it is termed *tonic* spasm. Such is the period of rigidity at the beginning of the epileptic attack and the prolonged rigidity of tetanus and cerebro-spinal meningitis. When spasm is brief and recurs rapidly, it is termed *clonic* spasm. Such are the intermitting and repeated muscular contractions following the inception of the true epileptic attack, and constituting the more ordinary epileptiform attacks or "fits" of children, the contractions of chorea and of hysterical seizures. The graver spasmodic diseases are true epilepsy, epileptiform attacks from many causes, as indigestion and worms in children, renal disease in adults, and in the course of severe acute diseases, narcotic poisoning, etc., chorea or "St. Vitus's dance," tetanus, hydrophobia. Many lesser and local states of spasm frequently occur. Sneezing and coughing are spasmodic contractions of

the respiratory tracts excited by irritation of the nasal or bronchial mucous membrane. Spasm of the larynx in nervous temperaments causes aphonia. Asthma is spasmodic constriction of many bronchial tubes, producing dyspnoea. Whooping cough unites extreme hyperæsthesia and spasm of the bronchi with spasmodic constriction at the larynx—a succession of violent expiratory spasms or coughs, followed by a sonorous or whooping inspiratory sound. Spasm of the heart, evidenced by dyspnoea, præcordial distress, and disturbed circulation, by intermitting and irregular heart-beats, has many causes—excess of food, indigestion, narcotic depression, Angina pectoris, or spasm of the heart, with associated spasm of the thoracic walls, is frequently due to disease of the coronary arteries, the nutrient vessels of the heart-wall. Spasm of the diaphragm may be due to indigestion, to taking cold, or to gouty or rheumatic vice. Intestinal colic and cholera morbus are conditions of painful spasmodic constriction of the intestines, due to cold or bad diet. In invalids and persons of sensitive nervous system painful spasms of various internal and external parts may develop suddenly from unknown or trivial exciting causes. The immediate relief of spasm is secured by so-called antispasmodics or nervines, as valerian, musk, camphor; by anæsthetics, narcotics, and sedatives, as chloral hydrate, bromide of potash, hyoscyamus, belladonna, opium. The permanent cure, when admissible, demands the correction of known causes, as debility, indigestion, and the rheumatic, gouty, and other blood-taints.

Spi'nal Cur'vatures, two kinds—(1) lateral curvature; (2) angular curvature. Lateral curvature is a deviation of the spinal column at one or several points from the position which it occupies in health in the median line of the back. It occurs in children, in young, imperfectly-developed, feeble, and growing adults, more especially women, and less often in men. The spine normally occupies the middle of the back, with a slight convexity to the right in the dorsal region; in this central position it is acted upon by many forces—the weight of the head and trunk, the lateral traction of the arms in all physical efforts, of the thoracic and abdominal muscles in breathing—and beneath has a divided support of the two lower extremities through the intervention of the pelvis. A lateral curvature may develop connected with any one of these forces; when the bones are poorly nourished, the spine may yield to the weight it supports. Habitual use of one arm to the exclusion of the other may cause deviation of the spine, cervico-dorsal, to the stronger side—

a common occurrence in weakly children at school, housemaids, and in some confining mechanical vocations. Disease of one lung, as phthisis, chronic pneumonia, pleuritic adhesions, and chest contraction, by limiting respiratory movement on one side, often causes dorsal curvature to the more active side. Shortening of one limb, hip-joint disease, persistent limping from any cause, by tilting the pelvis throw the spine out of centre and develop lumbar curvature. Whenever a curvature is thus primarily established, a secondary curvature develops at another part of the vertebral column, and to the opposite side, and thus the erect position of the body is maintained. The affected spine, viewed anteriorly or posteriorly, presents a double curvature, a tortuous line whose upper and lower ends can be connected by a vertical straight line, representing the component of all the forces, weight, etc., which the spine sustains. The collective vertebrae of the spinal column are so articulated and curved antero-posteriorly, the pressure taken in the "bodies" only, the lateral and posterior processes restrained by attached muscles, that lateral curvature causes rotations of individual vertebrae.

Lateral curvature, if of long standing, may so modify the size and conformation of the lung, so change the nutrition and structure of the intervertebral cartilages, and the muscular volume of the two sides of the body, that cure is impossible or incomplete. More often it is curable by correcting bad habits, as favoring one side in standing, sitting, or sleeping, resort to light gymnastics and special passive movements, and the use of apparatus which removes weight from the spine and applies pressure or traction to counteract the curves. General tonic treatment, cod-liver oil, and phosphates, out-of-door life, warm clothing, stimulating baths, and regulated diet are indicated in all cases.

Angular curvature is of more serious nature. It is termed Potts's disease, and is usually an expression of a tubercular or scrofulous blood-taint. Exceptionally, it may arise in previously vigorous persons, starting from a local injury of the vertebrae, followed by disintegration. More often, when health is reduced and the nutrition of the osseous and cartilaginous structures is defective, the intervertebral bodies atrophy, or are absorbed owing to pressure; the bony vertebrae thus brought into contact form an abrupt joint or antero-posterior angle, which replaces the normal graceful curve, and presents a more or less angular prominence on the back. The approximated vertebrae tend to caries or death and gradual disintegration: in proportion to the extent of this destruction of the vertebral bones and the inter-

mediate cushion of cartilage, the body above sinks forward and downward upon the parts beneath, and the angle is abrupt and acute. Caries of the spine usually develops a local abscess, slow in formation, often with little pain or heat, and tending to disseminate its contained pus beneath adjacent flat muscles of the back; the pus may finally point under the skin of the back or side, or travel around to the front of the abdomen, appearing as a soft tumor in the groin, or even below the flexure of the thigh; in these latter positions erroneously taken for hernia.

Early vertebral disease is indicated by pain in a fixed spot, increased by pressure, by firm tapping, by the sudden concussion of jumping, or by sudden turning; the pain often shoots around the body. The strength wanes, and the weight of the body causes fatigue, which is relieved by reclining, by supporting the shoulders, or by traction on the lower extremities when lying down. Loss of flesh and appetite, elevated temperature, and hectic fever develop as caries is established, and local inspection reveals a change of the normal curves or a perceptible projecting apex. The early arrest of angular curvature is secured in various ways—by rest on the side, with ice-bags to the irritated congested spine, rest with extension and counter-extension; but, when admissible, the plaster-of-Paris bandage may be applied to the body, and the patient may exercise. Cod-liver oil, phosphates, Peruvian bark, iron, and concentrated diet are to be faithfully administered. When abscess has developed, it may be “aspirated”—subcutaneously removed by needle-tube and pump. Where angular curvature is fully developed, apparatus is employed to place the body erect, remove the angular protrusion in the back, and permit the spinal column to become “ankylosed,” or rigidly united.

Spinal Diseases. See INFANTILE PARALYSIS, MENINGITIS, PARAPLEGIA, PROGRESSIVE MUSCULAR ATROPHY, SPINAL CURVATURES, TABES DORSALIS.

Spitting of Blood. See HÆMOPTYSIS.

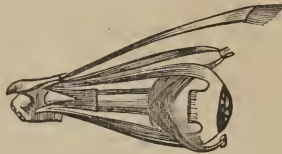
Spotted Fever. See FEVER.

Sprain [O. Fr. *espreindre*], a stretching or wrenching of a joint, without displacement of the bones, and either with or without lesion of ligaments or tendons. Severe sprains are sometimes quite as serious and lasting in their effects as dislocations. Perfect rest, cold or sometimes hot lotions (if the latter be more agreeable to the patient), with the use of splints for mechanical support and opiates to relieve pain, are required in the treatment. The removal of swelling and stiffness may be hastened by “massage,” gentle and protracted kneading.

Squint'ing [Dutch, *schuinte*], technically

termed **Strabismus** [from Gr. *στραβισμός*, “squinting”], obliquity of the axis of one eye; inability to bring both visual lines to bear simultaneously upon one point, one always deviating from the object. If the

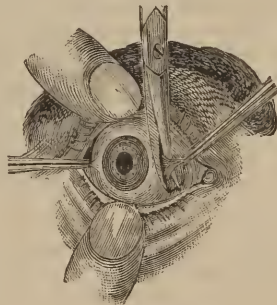
FIG. 1.



Muscles of the Eyeball.

squinting eye deviates inward, it is termed convergent strabismus; if outward, divergent strabismus; if downward, which is rare, *strabismus deorsum vergens*. The normal position of the eye and correct direction of its visual line depend on the tonicity of the four recti muscles, attached one above, one beneath, and one on each side of the eyeball. If one muscle is relatively weak or paralyzed, the eye is deflected to the opposite by the stronger or intact muscle. Convergent squint is very common in young children of four to six years when learning to spell or read with small letters. It may be periodic, and present only when looking intently and with effort, one eye being converged to facilitate or compensate the “accommodation” or power of the eye to adapt itself for different distances and objects. Such internal squint may be checked by

FIG. 2.



Operation for Strabismus.

use of larger letters or by checking the bad habit of approximating objects. When the eye is hypermetropic, having a low refractive power, a short antero-posterior diameter, and rays are not focused in the retina, voluntary convergence of the eye and habitual squint are the common result. Children suffering from indigestion, worms, or debility often suffer from convergent

squint, in some cases due to spasm of the internal rectus muscle, in others to debility or paralysis of the external rectus muscle. In disease of the brain, convulsions, meningitis, hydrocephalus, etc., squint may occur. Divergent squint is most often present in myopic or near-sighted persons in efforts to see distant objects, the squint disappearing when the object is approximated or by the use of spectacles for distance. It may also occur from paralysis of the internal rectus, or when that muscle has been too freely cut for the cure of convergent squint. In convergent strabismus, unless very marked, in order to determine the squinting eye it may be necessary to place a lighted candle or the finger two or three feet in front of the face in the median line, or, again, closing each eye alternately, to study the extreme lateral movements inward and outward of each. Periodic strabismus may yield to correct use of the eyes, the aid of spectacles, galvanizing the weak muscle, and improving the general health. When marked and persistent, it calls for operation—incision of the ocular conjunctiva or mucous membrane, hooking up the tendon of the muscle close to the cornea and severing it.

Stam'mering [Ang.-Sax. *stamer*], an affection of the faculty of speech characterized by irregular, imperfect, or spasmodic actions of the muscles concerned in articulation. It is in reality a chorea of the muscles concerned, a defective power of co-ordination. It may be manifested under two somewhat different forms. In the one there is a difficulty in beginning the enunciation of words, and this is especially shown in regard to those words which begin with what are called the "explosive consonants" (*b*, *p*), and which require the sudden opening of the lips. In the other form the word is begun, but after the enunciation of a syllable there is a spasmodic, and for a time uncontrollable, reiteration of the same syllable. To this variety the term *stuttering* is sometimes applied. Stammering is one of the mimic diseases, and may be acquired by carelessness in speech or by association with others similarly affected, or even by mocking such persons. In the majority of cases it disappears after the attainment of adult age, probably in consequence of the constant efforts of the subject to improve his habit of speaking. It is always increased by emotional disturbance, especially fright and apprehension, and is much mitigated, and often cured, by the patient acquiring confidence in himself, never attempting to speak in a hurry or when the chest is empty of air, or by reading measured sentences slowly and with deliberation. Stammerers never have any difficulty in singing, for they know that

a certain definite manner is to be observed, and this gives them the confidence they require. The affection is sometimes permanently removed in time by the patient performing some trifling muscular action contemporaneously with the enunciation of the words over which he stumbles. Thus, if he stammers at the word *baby*, he can prevent the fault by moving a finger at the very instant that he begins to utter the word, and so on.

Stom'ach, Diseases of. The most frequent diseases of the stomach are its functional disorders. (See INDIGESTION.) In addition to these milder and chronic conditions, the stomach is liable to acute and organic disease. Acute gastritis is of rare occurrence, the result of violent mechanical or chemical irritation, incised and punctured wounds, swallowing corrosive poisons or putrid and acrid food. It is characterized by violent ejection of all food, gastric mucus, traces of blood and bile, by sense of local burning pain, by pallor of the face, feeble flickering pulse, cold extremities, and collapse. Perforating ulcer of the stomach may occur in both sexes from tubercle or specific gummy tumor of the gastric walls, but most frequently exists in young women, often of full habit, due to rupture or embolism of some small blood-vessel, and resulting softening of a conical segment of the stomach-wall thus deprived of nutriment. The symptoms are pain in the stomach upon reception of food, its rejection, and occasional hæmorrhage when the ulcerative process has eroded a blood-vessel. Hæmorrhage from the stomach is termed HÆMATEMESIS (which see), and must be discriminated from HÆMOPTYSIS (which see), the spitting of blood from the lungs. Cancer of the stomach occurs more often in men than in women—most often occupies the pyloric end, rarely the upper cardiac orifice. It is usually the hard or scirrhus form of cancer. It often occurs in persons of cancerous family history, in others with no hereditary taint and previous personal health, following irritative dyspepsia. When at the pylorus, food is detained in the stomach, and after a time is ejected in great quantity, mixed with mucus, blood, and many fungous products of fermentation, especially *Torulæ* and *Sarcinæ ventriculi*. There is a local darting pain, and often a local indurated tumor felt at the epigastrium through the emaciated abdominal wall; the face is dark and cachectic, the body wasted; strength fails, death comes by exhaustion. Extreme neuralgia of the stomach—gastralgia or gastrodynia—may occur, dependent on deranged nerve-centres or rheumatic or gouty vice of the blood.

Stomati'tis. See MOUTH, DISEASES OF.

Stone in the Blad'der. See CALCULUS.

Strabis'mus. See SQUINTING.

Strangula'tion [remotely from the Gr. *στραγγάλη*, a "halter"] denotes, primarily, the mechanical closure of the air-passages of the neck, so as to prevent respiration. Death by strangulation is speedy, but there may be a chance of recovery for a considerable period. Artificial respiration, stimulant applications to the extremities and chest, and of ammonia to the nostrils, should be tried. Only when all other means have failed should the galvanic battery, a dangerous instrument, be employed. After apparent recovery, death may speedily ensue from secondary causes. (See DROWNING.)

Stran'gury [Gr. *σπράγξ*, a "drop," and *οὐρῆν*, to "urinate"], a suppression of the urine. The name is especially applied to such suppression when it depends on the presence of spasm or tenesmus of the urethra. It may be caused by the too free use of Spanish-fly blisters or of oil of turpentine, or it may attend the presence of calculi in the bladder. The warm bath, hot fomentations, mucilaginous drinks, bland enemata, and the like will usually relieve the untoward symptom.

Stric'ture [Lat. *strictura*; Gr. *στέγνωσις*], a constriction or compression of the tubiform organs of the body, as the œsophagus, the larynx, the windpipe, the intestines, the anus, the urethra, the lachrymal ducts, and others. Strictures are produced either by new formations on the inside of the tubes, or by pathological changes in the walls and coatings of the same (cicatrization), or by the pressure of new formations or of atrophies outside. Examples of the first class are croup and diphtheria, which by deposition of fibrinous masses on the interior of the larynx and the windpipe narrow in these organs sometimes to suffocation. A stricture of the third class is frequently produced in the œsophagus by a neighboring cancer, which may compress it to impermeability. The most frequent strictures are those of the urethra; they are generally produced by pathological changes in the coatings of the organ. Injuries of the perinæum and the penis, with or without rupture of the urethra, may originate them, but their most general cause is inflammation of the mucous lining of the urethra, gonorrhœa. Inflammation, if it spreads a little beyond the mucous lining, gives rise to new formation of connective tissue, which either directly compresses the urethra, forming a callous ring around it, or contracts it by atrophic cicatrization around the tube. The immediate consequences of urethral stricture are symptoms of impediment to free micturition. The urethra behind the

stricture is dilated by the pressure of the accumulated urine. The bladder is not thoroughly emptied, and undergoes inflammatory irritation by chemical decomposition of its contents. The urine becomes alkaline, with a putrid and pungent smell of ammonia. The desire to urinate is very great, and never ceases. In more advanced stages the urine sometimes breaks through the wall of the urethra behind the stricture, and either makes a fistula by breaking also through the skin, or infiltrates the surrounding tissue, and so causes uræmia, and often death. In other cases, inflammation of the bladder extends to the kidneys, and there produces pyelitis and inflammation of the kidney proper. Strictures sometimes close up the urethra entirely, or become so narrow that the urine can only be passed out in single drops by the strongest and most painful efforts. Speedy relief by operation is necessary in such cases to save the life of the patient. The treatment of stricture consists either in gradual dilatation or in external or internal urethrotomy. Gradual dilatation is effected by inserting bougies, or catheters, or sounds of increasing sizes. Every day or less frequently a larger instrument is passed through the stricture to the bladder, until the normal size of the urethra is attained. After this, the last bougie is used occasionally for some time to prevent a relapse. The majority of the authorities now consider gradual dilatation the best, surest, and safest treatment of stricture. In cases where no instrument can be passed through the stricture, or where for other reasons dilatation cannot be resorted to, external urethrotomy is indicated. The operation is performed by cutting into the urethra from the perinæum, thereby opening the stricture lengthwise. It is kept open by regular cathetrization, so that the healing wound leaves a canal of normal size. Internal urethrotomy is only applicable in cases where a sound can still be passed through the narrowed passage large enough to guide a small knife, which cuts and opens the stricture from inside. Another method sometimes resorted to is the rupture of the stricture by forcing through it a large, conically-shaped steel sound (forcible dilatation).

Stu'por [Lat.]. Stupor or coma is that condition in which, when fully developed, the functions of the brain, so far as the mind is concerned, are entirely suspended, and the individual lies unconscious, breathing heavily, and without the power of voluntary motion. It may be induced by pressure upon the brain, as from a depressed piece of bone of the skull, or the entrance of some foreign body, as a bullet; by a blow

or fall, causing concussion of the brain or compression from extravasated blood; by the rupture of a blood-vessel, causing cerebral hæmorrhage; by the circulation of poisoned blood through the cerebral vessels, as occurs, for instance, when an over-dose of opium or alcohol has been taken. Stupor is to be distinguished from sleep, with which, though sometimes confounded, it has in reality little or no analogy. In the first place, stupor never occurs in the healthy individual, while sleep is a necessity of life. It is easy to awake a person from sleep, while it is often impossible to arouse him from stupor. In sleep the mind may be active; in stupor it is, as it were, dead. An increased amount of blood in the brain will cause stupor, whereas sleep is the result of a diminished quantity of blood in the cerebral tissue.

Stupor is a symptom of serious importance in various injuries and diseases to which the brain is liable. It may exist in all degrees of severity; and in the partial forms the subject is either not entirely unconscious, or, if so, may be roused by impressions made upon the organs of the special senses, though usually only for a short time. There is a form of stupor, met with in certain diseases of the brain, in which the individual, though unconscious, is nevertheless not altogether deprived of the power to think and to move the limbs. There is, in fact, a marked degree of restlessness, though the movements are, as it were, automatic, and the speech is incoherent. This condition is known as "coma vigil." It generally only occurs in cases of great gravity, and it indicates a fatal termination. (For special conditions and treatment see APOPLEXY, CONCUSSION OF THE BRAIN, FAINTING, SHOCK, TYPHOID FEVER.)

Subluxa'tion. See SPRAIN.

Suffoca'tion. See ASPHYXIA.

Sun'stroke, Insolatio, or Coup de Soleil, prostration of the animal vitality from long exposure to the direct heat of the sun. The method of this nervous exhaustion may be by peripheral nerve-irritation in the extensive tract of overheated, congested skin, but more often is due to the overheating of the blood in the peripheral capillaries, and the sedative influence exerted by it upon the nutrition of the central ganglia. Sunstroke has been regarded as a state of paralysis of the vaso-motor or ganglionic nervous system. In its first form or stage, that of congestion and excitement, the surface of the body is intensely red and hot—a condition often disconnected with any actual sunburn, but due to general capillary relaxation and congestion consequent upon the impairment of the nerve-centres which control the

elastic arterial walls. For the same reason, the various large glands and organs of the body—liver, spleen, kidneys, lungs—are engorged with blood, swollen, and very tender to touch. The brain is congested, stimulated to excessive and incoherent mental action. The temperature of the body may be 112° F. or more; the pulse full, hard, bounding; the heart's action tumultuous; the breathing is hurried, labored, and noisy; the conjunctiva reddened, pupil contracted; there may be headache, delirium, convulsions. In graver cases, either at the outset or later as a second stage, one of depression or shock following that of excitement, the various vital functions may be alarmingly depressed, indicating suspended nutrition and organic change of the irritated nerve-centres. The patient becomes unconscious; the pulse feeble, compressible, and irregular; breathing slow, irregular, stertorous; the surface may be cool and pale; convulsive action is absent, and the muscular system completely relaxed. Death may occur suddenly by syncope or paralysis of the heart, by pulmonary congestion, by exhaustion, or by convulsion. After death the blood does not coagulate; hence there is no marked *rigor mortis* or rigidity of the body. Physical fatigue, exhaustion, over-clothing, bad ventilation, deficient drinking-water, alcoholic excess, are predisposing causes of sunstroke. Disturbance of the natural moisture, evaporation and radiation from the skin, is regarded the immediate cause of the overheating of the blood; hence, a murky, damp heat is attended with more cases of sunstroke than when the atmosphere, though hot, is dry and clear. The treatment of sunstroke consists in promptly withdrawing caloric from the overheated body, or, when shock and coma are present, by diffusible stimulants and revulsive agents, maintaining strength and relieving cerebral congestion. The cold douche to the head, neck, and chest, evaporating lotions or ice-bag to the head and spine, the wet sheet swathing the entire body, and cold immersion are agencies to be employed with judgment to the overheated body with the best results. Bromides may be employed, but arterial sedatives, as digitalis or veratrum, are dangerous. Conversely, in coma and the sinking stage or form, sinapisms, blankets, and heat may be applied to the surface, rich liquid food, ammonia, and alcohol administered by mouth or rectum, blisters applied over the nape of the neck.

Suppura'tion [Lat. *suppuratio*, "abscess"], a term employed in medicine and surgery to designate the process of pus-formation on the granulating surface of wounds in abscesses and in unhealthy action or inflammation of the mucous and serous free mem-

branes. Pus, popularly termed "matter," is a creamy-yellow, opaque fluid, composed of a liquid portion, *liquor puris*, and *pus-cells* or *corpuscles*. As it is developed in abscess or granulating wounds, either from degeneration of existing tissues or from hasty, imperfect, or retrograde cell and tissue formation, its constituents are to be studied only as vitiated and changed forms of the cellular and liquid elements of the blood or of the elementary cells, as lymph, epithelial, and mucous cells, which have but recently developed from the blood. The creamy consistency and yellow color of pus varies with the abundance or scarcity of the pus-cells in the liquor puris or colorless pus-serum. These pus-cells, though somewhat larger than the white blood, lymph, and mucous corpuscles, are not easily distinguishable. They are lacking in power to organize and form cells and tissues, and are characterized by the presence of one or several nucleated masses, which are rendered visible by dilute acetic acid, which clears away the granular opacity of the albuminoid cell-contents. Pus-cells tend to speedy disintegration, their contents undergoing fatty degeneration, and their cell-walls rupturing, disseminating fatty and necrosed or dead granules throughout the *liquor puris*. Such pus is not creamy and yellow, but often thin, watery, dirty or brown in color, and has an offensive smell, and is termed ichorous pus; pus is often discolored by blood. The pus formed on free surfaces, as on the mucous lining of the nose or bronchial tubes, is largely a product of cast-off or rapidly-formed and degenerated epithelial cells. In other places, as abscesses, where congestion or inflammation exists, good authorities maintain that the white blood-corpuscles migrate through the coats of the capillaries, and, failing to organize, become pus-cells. This occurs either as the result of over-pressure, inflammations of dense structures notably terminating in suppuration, or in consequence of impurity of the blood or lowered vitality of the nervous force. Suppuration when *circumscribed* constitutes abscess, which tends to discharge through the nearest surface, either of the exterior of the body or of some internal cavity. Diffuse suppuration occurs in erysipelas and in catarrhal inflammations, as of the air-passages, stomach, and intestines and bladder. The formation of pus is hastened by applications of heat and moisture—hot fomentations and poultices. Its formation is often announced by a slight chill, and accompanied by a febrile disturbance and pulsating, throbbing pain, either dull or intense, at the point of pus-formation. Diffuse or uncircumscribed suppuration of the solid tissues endangers life by

absorption of purulent or ichorous septic matter; pus absorbed into the blood develops pyæmia or septicæmia, characterized by lowered vitality, hectic fever, sallow cachectic complexion, sweet breath, multiple abscesses in different parts of the body, exhaustion, and death.

Sweat'ing Sickness, one of the several prevalent and fatal epidemics occurring during the fifteenth, sixteenth, and early part of the seventeenth centuries. It was also known as "pestilent sweat" and as the "English ephemera," as the English people both at home and abroad were chiefly attacked. In Germany, Holland, Sweden, and Denmark it prevailed more mildly. It first appeared in England in 1485. It was of brief period both in individual cases and in duration of single epidemics. Fully half of the population in infected towns were taken down with the disease, the mortality great, but where death did not result all danger was past in twenty-four hours, and epidemics rarely lasted a month. Of the five great English epidemics of the sweating sickness, the remaining four were in 1506, 1517, 1528, 1551. The attack consisted of a febrile and sweating period. It commenced with pains in the back, shoulders, and limbs, flushes of heat, oppression at the liver and stomach, pain in the head, delirium, palpitation, followed by heaviness and desire to sleep, which in fatal cases tended to become profound coma or stupor. Profuse sweating now set in, in favorable cases leading to speedy convalescence. The patient was liable to one or many relapses. The disease spared the aged and young, attacking chiefly middle-aged, plethoric men of all classes and rank. Both in England and on the Continent the greater prevalence of this disease among Englishmen was attributed to their peculiarly gluttonous, excessive diet. By Hecker, Guy, and others the several epidemics of this disease are ascribed to preceding periods of atmospheric and telluric insalubrity, the influence of gathered armies, and to the absence of house and street drainage in the larger cities and towns. Its period of incubation, rapid progress, and speedy convalescence disconnect it from epidemics of the typhus class. Hecker has termed it "a rheumatic fever in the most exquisite form that has ever yet been seen in the world." It has also been regarded a form of influenza or catarrhal fever. Guy considers it undoubtedly of malarial nature, an ague with short febrile and sweating stages, often malignant and fatal in the first or congestive period, and in convalescence leaving, as in all malarial periodic disorders, a temporary lassitude and frequent recurrences. The treatment most successful in these epidemics

was absolute rest for twenty-four hours, and blanketing, warm air, and warm drinks to hasten profuse sweating.

Syco'sis. See BARBER'S ITCH.

Syncope. See FAINTING.

Synovial Mem'brane [Gr. *σύν*, "with" or "resembling," and *ὄν*, "egg"], a membrane in the animal in structure resembling serous membrane, but having a secretion unlike the thin watery product of the latter, and termed synovia or synovial fluid, denoting that it is thick, viscid, and glairy like the white of an egg. There are three classes of synovial membranes in the human body: (1) The articular, or those lining the lateral and antero-posterior walls of the closed cavities of the joints, and secreting a fluid to lubricate the opposed cartilaginous surfaces of the articulating bones. (2) Vaginal or sheath-like synovial membranes, which surround the tendons when passing through osseo-fibrous canals or grooves in the surfaces of bones, as is the case in the hand and foot. (3) Bursæ (Gr. *βίρσα*, "a bag"), little synovial sacs or cushions interposed between parts moving one upon the other with friction, as where a tendon glides over or presses directly upon a bony prominence. The synovial fluid consists of nearly 95 per cent. of water, rendered viscid by mucus, epithelial cells, fat, albumen, and salts. The synovial membranes are often diseased.

Synovitis. Acute synovitis, acute inflammation, may attack any joint as the result of violent injury, exposure to cold, rheumatic taint, or less often from vitiated blood in the course of fevers and other diseases. The symptoms are local swelling, extreme tenderness upon touch or pressure, pain when moved, and often persistent agonizing pain caused by the distension of the sensitive inflamed cavity by a hypersecretion of fluid. Penetrating wounds of the large synovial cavities, whether gunshot, incised, or occurring in connection with fractures, are serious, often necessitating the loss of a limb. Chronic synovitis is often a product of tubercular or scrofulous hereditary taint, with injury or over-use as incipient or exciting cause. The destructive process often involves the ends of the bones and the ligaments which are softened and disintegrated. Abscess, partial dislocations, and ankylosis, or stiff joint, are the chief misfortunes which result. The synovial bursæ often become swollen and prominent by hypersecretion, and also by injury and inflammation. Such is the ganglion or "weeping sinew" of the back of the wrist. It resembles a cystic tumor; its contents must be evacuated and the membranous sac irritated or lacerated to obliterate it by adhesive inflammation. The occurrence of distended bursæ, and difficulty

of cure in many cases, are due to their connection with the cavity of an adjacent joint.

Syph'ilis [etymology uncertain], the *lues venerea* of old authors, and vulgarly known in English as "pox." Syphilis is a specific venereal disease, contracted chiefly in impure sexual congress, rarely by other and accidental inoculation, and also capable of transmission in a chronic form from parent to offspring. Syphilis is first manifested by an initial sore at the point of inoculation on the genitals. This initial sore is known as a chancre, and constitutes primary syphilis. It appears, on an average, two weeks after the cohabitation by which the contagion was transmitted. At the time of coitus the syphilitic virus was received in some fissure or abrasion, or absorbed by the follicles or thin skin of the parts. It then remained latent in the system for a period of incubation until the appearance of the chancre, which denotes not merely local venereal poison, but a specific infection of the entire body. The true chancre is single, the presence of several venereal sores denoting that they are "chancroids" or false chancres, also termed "soft chancres." A true chancre is smooth, with thin adherent edges and a livid-red base, with but little matter. Its edges are decidedly indurated, the hardness being peculiarly circumscribed. False sores, on the contrary, have sharp-cut, square edges, a dirty gray base, with more or less secreted pus, and are either soft at the edge or have an area of inflammatory thickening extending out into the adjoining tissues. The initial sore, or ulcer, or chancre may heal with or without cauterization. But in from twenty-five to fifty days later the constitutional infection is further demonstrated by the appearance of a cutaneous eruption on the various parts of the body, the face, and in the hair. This eruption may appear even as late as six months. It may be a simple roseola, or scattered roseate spots, or a papular eruption. About this time a concurrent eruption appears in the mouth and throat, mucous patches on the tongue and walls of the mouth, inflammation, ulceration, and exudation in the soft palate. Iritis is liable to occur at the height of the eruptive period, which is designated the period of secondary syphilis. If untreated, syphilis is likely to progress, and affect not merely the superficial structures—skin and mucous membrane—but also the special organs and deep tissues. Periostitis, or inflammation of the fibrous sheath of bones, is next in order; soreness of the shins, swollen glands in the neck and groin, scabs in the scalp, falling of the hair, gummy tumors beneath the skin, finally breaking as small abscesses, inflammation and loss of the nails of the

fingers and toes, nodes on the skin, osteitis, with persistent rheumatoid pains in the limbs at night, ulcerative destruction of the palate and nasal bones, are all liable to occur progressively in from six months to three years when the disease is not checked by specific treatment or it has been implanted in a constitution shattered by dissipation. Extensive changes in the brain, liver, glands, bones, etc. gradually take place, and the disease being fastened upon the system, "tertiary syphilis," ineradicable, is said to exist. The sexes contaminate each other with syphilis only when a fresh initial sore is present. But either parent may transmit syphilis to the child *in utero*. In this way the father, if having secondary or tertiary syphilis, may beget a syphilitic child without inoculating the mother, but the mother becomes contaminated by the child so begotten before its birth by the intercommunication of the maternal and fetal circulation. The syphilitic fœtus often is still-born, syphilis being a common cause of miscarriage at the third to the seventh month of utero-gestation. But if born alive it usually is poorly nourished, covered with large patches of syphilitic ecchyma, and has the "snuffles," a peculiar syphilitic infantile catarrh. Its chances of living are not good, and it steadily declines or is taken off by the first intercurrent disease of infancy. A syphilitic child may inoculate the nipple of a healthy wet-nurse. Conversely, a syphilitic wet-nurse probably can infect a healthy infant.

Constitutional syphilis, whether acquired by inheritance or existing as tertiary syphilis, constitutes a serious vice of the blood, and endangers phthisis and steady failure of bodily powers. When a syphilitic sore or chancre is contracted, it should at once be submitted to a competent physician. If undoubtedly a true chancre—single, hard, and livid—it may be healed either by cauterization or by the milder applications for ordinary sores. But the constitution must be treated for the general taint which has entered the blood. It is a rule with many to heal the sore and wait twenty-five or more days that the appearance of an eruption and sore throat may prove to the physician and patient beyond cavil that the sore was a true chancre, and not a false chancre or an erosion, and also that syphilis has to be combated; for an immediate specific treatment, by masking the secondary stage, may cast doubt upon the reality of the disease, and lead the patient to neglect long-continued and curative treatment. The treatment of secondary syphilis is at first by mercurials, until the eruptions, sore throat, and other manifestations begin to yield; then by a "mixed treatment" of

mercury and iodide of potassium. The person under such specific treatment should observe regular hours, eat and sleep well, avoid stimulants, and, if necessary, take tonics and appetizers to co-operate with the specific remedies by improving the general nutrition. Specific treatment may at the onset border on salivation, to produce an impression on the disease, but thereafter should be continued in small doses for a long period. In good constitutions the disease may vanish from sight in a few weeks, but is liable to crop out at intervals and leave vague sequelæ like neuralgia and catarrhs, unless the remedies be used steadily or intermittingly for two or more years. It is thought that four years should elapse between the contraction of syphilis and the date when marriage is justifiable or the patient is safely insurable—events which demand a thoroughly purified and uncontaminated blood. The complete eradication of the taint is questioned by some authorities.

Ta'b'es Dorsa'lis, Phthisis Spinalis, Duchenne's Disease, better known as **Progressive Locomotor Ataxia**, a degenerative condition of the posterior gray column of the spinal cord, usually by the successive steps of fatty degeneration, granular disintegration, and atrophy, from which the terms *tabes* and *phthisis*, denoting "wasting." The term "progressive locomotor ataxia" is descriptive of the chief features of the disease. Ataxia (Gr. *a* privative, and *τάξις*, "arrangement" or "order") designates the peculiar loss of control in this disease over groups of muscles which in health are co-ordinated or employed in unison. This deranged, inharmonious action of muscles is limited chiefly to the lower extremities, and manifested when attempting to walk; hence the term "locomotor," while the affix "progressive" indicates the steady and hopeless progress of the malady. The sight aids greatly in the precision and certainty of walking. Hence, in the early stage of ataxia the gait may be unsteady only at night, twilight, or when the eyes are closed. In more advanced stages the patient has not sufficient control to stand with the eyes shut, and, on attempting to walk the limbs move irregularly and wildly, the feet coming down abruptly with a flapping sound, the patient catching at support or falling. The limbs, though wholly beyond control for walking, are not paralyzed, and retain full power, as demonstrated by the dynamometer. Intense pains, of electric rapidity and lancinating severity, shoot from the feet to the thighs, trunk, and often to the head. The soles of the feet often are anæsthetic, and seem to the patient puffy, as if walking on down or velvet. There may be anæsthesia of other

parts. The rectum and bladder may be impaired, and the sexual appetite and power are usually annihilated. There may be local dull pain over the spine, denoting the point of disease, and also a slight sense of constriction at a corresponding level, as if a string were tied round the body. The mind, as a rule, is sound, except so far as long-continued intense pain, sleeplessness, and knowledge of the desperate and hopeless nature of the disease dispirits and demoralizes. Alcohol freely taken relieves the pain, and opium, especially administered subcutaneously. But the pain constantly recurs, and hence either the alcohol or opium habit is apt to become established in ataxic patients. Cold and changeable weather intensifies their distress. Hence, they should be placed in warm, sunny rooms, protected from damp and chilly air, and well housed in winter. This disease of the spinal cord is in some cases induced by intemperance; in others by licentious excess and specific disease; in others it would seem the reflex result of disease of the bowel and the urinary tract, as in stricture of the rectum, hæmorrhoids, urethral stricture, etc. Habitual exposure to inclement weather and the rheumatic and gouty vices of the blood may induce it. When due to specific blood-states, as rheumatism, gout, and syphilis, there is hope of cure or arrest of the disease by specific treatment. But more often the cause is obscure and of slow, insidious approach; it is surely "progressive," and treatment is limited to general tonic and hygienic measures, and assuaging pain by anodynes.

Tal'ipes. See CLUB-FOOT.

Tape'worm, *Tenia* [Gr. *taiva*, "tape"], a species of entozoa or intestinal worm infecting the alimentary canal of men as well as dogs, sheep, and other animals. In Iceland, where the dogs, sheep, and masters often are housed together and drink from the same receptacles, the transmission of the parasite from animals to men is common, every seventh person being said to have tapeworm, and many the associated disease, HYDATIDS (which see). The tapeworm is so called because it is flat, soft, broad, and white, and not unlike a tape. It consists of a head, which is the vitalizing part of the worm and essential to its life; a neck, usually half an inch long and one-eighth or less broad; and a variable number of quadrilateral segments or "links," which, according as they are few or many, extend the worm from 10 or 20 feet to 100, or even 150 feet, in length. Each link is generated at the neck, intermediate between the neck and the previous link. Thus links, as they are formed, are pushed on to make

way for new intermediate links. The links farthest removed from the head and neck are therefore the oldest, and with age they will have grown thicker, firmer, and broader, so as to be one-quarter or one-half an inch broad in many cases. Each link or segment is composed of homogeneous fibrous structure, with no alimentary canal, but a water-like circulation by imbibition which extends from link to link. The links are held together by an almost transparent albuminoid substance. Each link is bisexual, having a central female duct full of ova and lateral male organs. The actual lifetime of an undisturbed tapeworm is variously stated, probably three years.

There are three varieties of tapeworm: 1. *Tenia solium*; 2. *Tenia medio-cancellata*; 3. *Botriocephalus latus* or *Tenia lata*. The first grows to great length, 100 or 150 feet, and, as its name implies, is usually alone or single. Its segments are longer than they are broad, the neck long, often an inch, and the head has a nose-like prominence, two rows of silicious hooks, a dozen or more in each row, and back of them four "suckers." The second has neither snout nor hooks on the head, only the suckers; the neck is shorter and the links are thicker, shorter, and broader. The third variety has on the head only two lateral slits or suckers, a short neck, and very broad links.

The tapeworm is usually detected by the patient finding links in the passages from the bowels. The symptoms caused by its presence are not dissimilar to those of gastric and intestinal indigestion. The worm is usually in the small intestine, rarely in the stomach or lower bowel. Colicky pains, sense of motion in the bowels, capricious and impaired appetite, defective health and strength, and lack of flesh are its chief indications.

Tapeworm is cured by remedies which impair the vitality of the worm or wrest it from its hold by its hooklets and suckers on the mucous membrane. They may bring it away piecemeal, but until the head is secured it will continue to renew. The plan usually pursued is to cause the patient to empty the stomach and bowels by a cathartic, as castor-oil, then to fast twelve hours, following which a full dose of a specific medicine is given, and again in the morning a cathartic to bring away the worm. The remedy so given may be the fluid extract of male fern, powdered koussou, decoction of pomegranate-bark, or powdered pumpkin-seeds, all of which are efficacious. Other remedies, as carbolic acid, turpentine, opium, calomel, are given in small repeated doses, often with good results. (See ANTHELMINTICS and VERMIFUGES.)

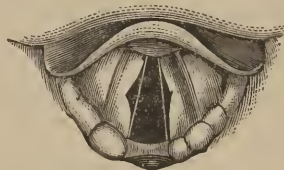
Tap'ping (*Paracentesis*), in surgery, is the piercing of the walls of a cavity so as to draw off a dropsical or other collection of fluid. The abdomen, chest, scrotum, and even the head, are often tapped for the removal of such effusions. The trocar and canula answer for the performance of the operation in many simple cases. In some others the contained fluid has to be removed by the aspirator, an instrument acting as a pump or syringe. Tapping often affords great relief, and occasionally is of great service toward recovery, especially in cases of pyothorax and hydrothorax.

Teeth. See **TOOTHACHE**.

Tet'anus [Gr. *τέτανος*], a dangerous spasmodic disease characterized by paroxysms of tonic muscular contraction, succeeding each other with varying frequency for days or weeks. The spasms usually appear first in the muscles of mastication, producing the condition popularly known as "lock-jaw," then involve the large muscles of the trunk, then those of the extremities and those concerned in respiration. In a paroxysm the patient's face is livid or purple, his respiration suspended, his whole body rigid and usually arched backward, owing to the greater power of the muscles of the back. Such a spasm lasts several seconds, and may cause death by arrest of respiration. Fever of varying intensity is present, and extreme exhaustion follows the paroxysms. Death is the more common issue in acute cases, occurring in two or five days. Occasionally, tetanus of less intense type becomes chronic, lasting weeks. The causes of tetanus are wounds, especially ragged and punctured wounds in parts richly supplied with nerves, and certain atmospheric conditions not yet accurately known. Dampness and great variations between the diurnal and nocturnal temperature seem to favor the occurrence of the disease. It is probable that tetanus arises from unknown causes independently of injury. The essential pathological condition of the nervous system in tetanus is not known, though a number of recent investigations seem to indicate that in many cases there exists a diffuse, central myelitis, or inflammation of the spinal cord. Tetanus has been successfully treated by chloral hydrate, opium, chloroform, cannabis indica, curara, and by timely removal or separation of the nerves which are irritated by the wound.

Throat, Diseases of. Although the specialty of the study and treatment of throat diseases is designated "laryngology," it includes diseases of the posterior nares, the fauces, pharynx, and larynx. Exceptionally, some of these diseases may be suspected, or even diagnosed, from symptoms only, as

laryngitis from hoarseness, stridulus, and aphonia; chronic tonsilitis from muffled voice and habitual snoring; elongated uvula and papular pharynx from habitual spasmodic pharyngeal cough. But physical exploration, the direct examination of the oral cavity and the passages to the posterior nares and larynx, is essential both to diagnosis and to correct treatment. Simple examination—the depression of the tongue by a spoon or tongue spatula—will suffice in many cases, exhibiting the tonsils, soft palate, uvula, posterior wall of the pharynx, and the top of the epiglottis. To discover the root of the tongue, the entire epiglottis, the true and false vocal cords, the chink of the glottis, and even the upper rings of the trachea and division of the bronchia, the laryngoscopic mirror must be employed. Laryngoscopy may be performed by the use of either bright sunlight or a concentration of artificial light. Specialists employ lamps with condensing



Healthy Larynx.

prisms, and where very bright light is desired the oxyhydrogen light is used; with such methods of illumination the examination is conducted in a dark room. A good light, whether the sun's rays or artificial, is reflected, by a concave mirror held by the physician or worn upon a head-band, into the patient's opened mouth. The patient's tongue being drawn forward and gently held, a small circular or oval laryngeal mirror is introduced. There are several sizes of mirrors, varying in diameter from one-quarter to one inch in diameter; they are attached to delicate handles at an angle, so that when passed to the back of the throat they catch the rays thrown into the mouth by the concave mirror, and reflect them downward, illuminating the larynx. The parts thus rendered luminous present a distinct picture in the small laryngeal mirror above them; and this is seen by the observer through the perforated centre of the concave mirror, since the axes of light return by reflection to the reflecting surface from which they started.

The laryngoscopic examination is easily accomplished after a brief period of practice. More difficult is the exploration of the upper pharynx and the posterior nares, termed rhinoscopy. The uvula has to be

drawn forward, and the reflecting laryngeal mirror passed well back and turned upward. When correctly held, a distinct image of the septum between the nostrils, and of the extensive corrugated surfaces of the naso-pharyngeal spaces, is transmitted to the eye. Patients are easily trained to permit the presence of the throat mirror, and even to explore their own throats (auto-laryngoscopy). The movements of the vocal cords are displayed best by phonating *a* (*eh*). All of these several connecting parts of the throat are richly supplied with blood-vessels, lined by a mucous membrane, secreting mucus. They are therefore liable to hypersecretion of mucus, or catarrh, which may be acute, subacute, or chronic; to active and passive congestions, inducing redness, heat, and swelling; to active inflammations, with formation of submucous abscess, erosion of the epithelial covering of the mucous membrane, or ulceration and sloughing of its deeper layers. Such destruction of soft tissue may induce necrosis of the underlying hard structures, the nasal and laryngeal cartilages. Inflammation may terminate in an exudation, developing organized membranes, as those of croup and diphtheria. Repeated congestions and inflammations tend to engorge and hypertrophy the structures of the mucous membrane and glandular bodies embedded in it. The papillæ of the back of the throat and of the columns of the fauces are very often thus enlarged. The surface is seen to be studded with prominent ovoid papules or tubercles, a condition known as "clergyman's sore throat," and technically as "papular pharyngitis." Polypoid growths of variable size develop in the nares, pharynx, and on and around the vocal cords—products of papular growth and of granulation process.

A most alarming and critical condition is acute œdema of the glottis. The secretion of the region of the larynx being suddenly checked, as by cold, or the seat of sudden determination of blood, serum transudes from the overloaded blood-vessels into the loose submucous connective tissue, and creates a sudden dropsy and tumefaction. The distended, swollen structures overlap the opening of the glottis, and occupy the ventricles of the larynx, preventing inspiration, and threaten immediate death by suffocation. The laryngoscopic mirror definitely locates the seat of these dropsical sacs, and is the sure guide to efficient scarification and evacuation of their contained fluid. The vocal cords may be affected by spasms, producing hoarseness, aphonia, and labored respiration, in which case the mirror detects the unusual approximation and irregular action of the cords, and excludes the pres-

ence of more serious inorganic disease. One of the vocal cords may be found paralyzed, inactive, and relaxed, while the other remains normal. Such paralysis of a cord may be due to vocal inflammation or abnormal growth, or may depend upon lesions of the recurrent nerves in the neck, or again, coexisting with paralysis of one-half of the body, depend on a lesion of the brain—softening, embolism, apoplexy. Ulceration or inflammation may so seriously damage the vocal cords that cicatricial or scar-like tissues are formed, tending to contract and harden; in time the chink of the glottis becomes contracted and narrow—termed "stenosis of the larynx." The aperture being no longer adequate for the ingress or egress of air, gradual suffocation must ensue unless surgical relief is afforded. Extensive destruction of the vocal cords often occurs from syphilis and epithelial cancer.

The more accurate diagnosis of throat diseases, and intelligent study and classification by aid of laryngoscopy, have led to corresponding progress in treatment. Applications are no longer applied at random by probangs, uncertain of the condition that exists and of the parts which are reached. Remedies are applied with accuracy by various methods, with definite regard for the indications of each case. Astringents—as cold water, alum, tannin, tincture of iron, and solutions of nitrate of silver—are employed to contract blood-vessels, lessen congestions and relaxations of surfaces. Caustics are used to remove papular and granular developments, and induce absorption of hypertrophied structure. Local applications are made to heal ulcers. Inflammation is checked, limited, and cured by warm solutions and vapors impregnated with salts of soda, ammonia, and potash, or in other cases by cold gargles or spray. The salines tend to increase and liquefy the secretions of the throat; resin oil and astringent agents lessen them; earbolic acid, chlorine, etc. disinfect them when septic. Anodynes are given to allay pain, either by the stomach or locally. Electricity is applicable directly to the paralyzed vocal cord. The knife is constantly of service in treating throat diseases, for the excision of the tonsils and uvula, opening abscesses, the incision of hard papules, preceding use of caustics, removal of polypi, the scarification of œdema of the glottis, and for the operations of tracheotomy and laryngo-tracheotomy, whenever, by congestion, inflammation, ulceration, stenosis, tumors, cancer, sudden œdema, croupous or diphtheritic membrane, or whatsoever obstruction, the larynx is closed to the passage of air and death is imminent by suffocation.

Thrombus [Gr. *θρόμβος*, a "clot"], in pa-

thology, designates the fixed venous blood-clot. Thrombus often accompanies phlebitis. It is conceded that dilatation or contraction of a vessel or great weakness of the heart's action, may favor the formation of thrombus. Thrombi are liable to putrefactive changes, whence follow metastatic abscesses and a long train of deplorable consequences. When thrombus exists, a rich diet, tonics, and pure air afford the only prospect of recovery.

Thrush. See MOUTH, DISEASES OF.

Tic Douloureux. See NEURALGIA.

Tongue, Diseases of. The tongue may be inflamed from various causes, as hot drinks and irritants. It is often the seat of aphthæ, ulcers, "cancers," the result of catarrh of the mouth. The "coated tongue" may be due to a relaxed, flaccid, and pale condition of the papillæ, and when noticeably coated has an accumulated stratum of thickened saliva and rapidly exfoliated epithelial cells; the yellow color the result of the fatty metamorphosis which the cast-off cells speedily undergo. When the stomach is inflamed or irritable, the papillæ of the tongue will often appear as distinct points. The tongue is occasionally attacked by epithelial cancer. Ranula is a cystic tumor beneath the tongue, due to occlusion of some one of the salivary ducts. When any part of the tongue is the seat of motor paralysis, loss of sensation or taste, the part so deprived may be experimentally defined, and a study of the nerve-supply of the tongue will point to the part of the brain in which the lesion exists. Exceptionally, in infants the "frænum" or fibrous cord beneath the tongue is too short; the "tongue-tied" infant cannot nurse well, and when older speaks imperfectly; the cure is by cutting.

Tonsillitis. See QUINSY.

Tooth-ache may be due to diseases of the dentine of the tooth itself—caries, ostitis, exostosis; to congestive inflammation or disease of the nerve in the tooth; to inflammation of the gums and alveolar processes or bony sockets of the teeth, with or without more general disease of the upper or lower jaw, as when fractured or affected by scrofula, syphilis, or phosphorus; to simple nervous debility or disorder, as from emotional causes, excitement, fatigue; to general blood states, as in invalids from any cause, especially phthisis, anæmia, and malaria. The cause of toothache should, if possible, be discovered. It is usually due to diseased teeth, which should be filled or extracted. Abscess of the gums should be incised. When purely neuralgic, improved diet, out-of-door life, and tonics are indicated. Malaria demands quinine; anæmia, iron; struma, cod-liver oil. The nervous cases yield to opiates, sedatives, and ner-

vines. For the immediate relief of tooth-ache local leeching, cupping, poulticing, fomenting, lotions of chloroform, laudanum, and aconite, embrocations of oil of peppermint and chloral camphor, and the use of opiates, chloral-bromides by the mouth, are useful measures.

Toxicology [Gr. *τοξικόν*, "poison," and *λόγος*, "discourse," a treatise on poison]. Poisons are classified with reference to their source, as (1) animal, (2) vegetable, (3) mineral, and also with reference to their method of action: (1) corrosive and irritant poisons, such as corrode or inflame the stomach; (2) narcotic and sedative poisons, which, being absorbed by the mucous membrane, enter the blood and act on the nerve-centres. *The corrosive poisons* are—1. Acids—oxalic, hydrochloric, sulphuric, nitric. 2. Strong alkalies—ammonia, caustic potassa, and soda; alkaline earths—baryta and lime. 3. Metallic and other bases and their salts—corrosive sublimate, arsenic, sulphate of copper, tartar emetic, acetate of lead (sugar of lead), sulphates of iron and zinc, nitrate of silver, phosphorus, iodine, creasote, carbolic acid. *The narcotic and sedative poisons* are chiefly opium, belladonna, stramonium, hyoscyamus, aconite, digitalis, veratrum, tobacco, lobelia. Chloral hydrate is anæsthetic and depressant in large doses. Hydrocyanic acid depresses the heart or is immediately fatal. Strychnia and nuxvomica act specifically on the nervous system, causing muscular rigidity and spasmodic contractions. Poisons are often taken with suicidal intent, by accident, as by children or by adults erroneously as medicine or drink, and when carelessly dispensed by druggists, as oxalic acid instead of salts, morphia or strychnia instead of quinine. The symptoms of poisons are chiefly extreme disturbance of the stomach, the breathing, and the pulse, often with impairment of sight and great bodily weakness, pallor, and cold surfaces. Corrosives and irritants cause burning pain in the stomach.

Antidotes for poisons should be given immediately, while waiting the arrival of a physician. *For poisoning by acids* give alkalies, solutions of soda, potassa, lime, ammonia; afterwards white of eggs and sweet oil to soothe the stomach; *for poisoning by alkalies* give dilute acids, as vinegar or lemon-juice, and olive oil, which unites with the alkalies to form a soap and renders them inert; *for corrosive sublimate*, white of eggs and wheat flour; *for arsenic*, the hydrated peroxide of iron, kept by most druggists and many physicians. It can be made by adding aqua ammonia to liquor ferri-persulphatis, or even to common tincture of iron; the resulting precipitate is to be used in tablespoonful doses.

The new dialyzed iron is a ready and efficient antidote; magnesia may be used if no other remedy is obtainable. *For sulphate of copper*, white of eggs, milk, flour; *for tartar emetic*, oak-bark, tannin; later, opium to allay pain in the stomach. *For sugar of lead* (acetate of lead), sulphate of magnesia, making an inert sulphate of lead in the stomach and system; *for sulphate of iron* (copperas) and *sulphate of zinc*, bicarbonate of soda, freely given; *for nitrate of silver*, common salt, freely given, converting it to chloride of silver; *for phosphorus*, a mustard emetic; later, opium and ice to quiet the stomach; *for iodine*, boiled starch; *for creasote and carbolic acid*, olive oil and white of eggs. *In opium poisoning*, (opium, laudanum, morphine, paregoric), emetics, as sulphate of zinc or copper, the stomach-pump, frequent draughts of strong coffee, constant exercise, as walking to prevent sleep, belladonna by the mouth, atropine hypodermically, and the electric battery to the diaphragm and chest to keep up breathing; *for belladonna*, opium; *for stramonium, hyoscyamus, aconite, digitalis, veratrum, tobacco, and lobelia*, alcohol freely, to restore the pulse; *for chloral hydrate*, alcohol and the electric current. Hydrocyanic acid is usually instantly fatal; in small doses it depresses the pulse, and alcohol is the remedy. *Poisoning by wild fruit and berries* is usually due to the sedative effect of their juices, and demands vomiting, and alcohol to sustain the heart; so also in *poisoning by the flesh of pigeons or game* which has fed on wild berries. *Strychnia* (and *nux vomica*) poisoning requires inhalations of chloroform and chloral by the mouth or hypodermically.

Trichi'na Spira'lis, a parasitic nematoid worm infesting the muscular tissue of the pig, the rat, and some other animals, and liable to occur also in man. As commonly found, this worm is a quiescent encysted parasite, occupying, often in great numbers, the tissue of the voluntary muscles. The cysts are oval in form, more or less shuttle-shaped or pointed at the two extremities, lying between and parallel with the muscular fibres, about $\frac{1}{60}$ th of an inch long and $\frac{1}{100}$ th of an inch wide. When of recent origin, they are quite transparent and colorless, and hardly discernible by the naked eye; after a certain period they become partly opaque from the deposit of calcareous matter, and are then visible as minute whitish specks scattered through the muscular tissue. The worm lies perfectly free in the cavity of the cyst, coiled upon itself in a spiral manner, from which circumstance its specific name is derived. When stretched out it is of a tapering, cylindrical form $\frac{1}{28}$ th of an inch long, $\frac{1}{65}$ th of an inch thick in its widest portion. Its posterior extremity

is blunt and rounded, but the anterior half of the body tapers gradually from behind forward, and is comparatively slender. The mouth and anus are situated respectively at the anterior and posterior extremities, and the intestine runs in a direct line from one to the other. The sexes are separate, different individuals being either male or female, but the sexual organs are incompletely developed, and do not exhibit any functional activity. The worm often moves distinctly while still in the cavity of the cyst, the movements consisting of occasional sluggish, partial flexion and extension of the two extremities. In this imperfect and practically sexless condition the parasite may continue for an indefinite time, retaining its vitality, but undergoing no perceptible change. When, however, a portion of trichinous flesh is devoured in the raw state by man or certain kinds of inferior animals, the muscular tissue and the encysting capsules are liquefied by digestion, and the worms are set free in the cavity of the intestine. Here they at once increase in size, and in about two days become developed into mature and sexually perfect trichinæ. The sexes are now readily distinguishable from each other. The male is $\frac{1}{20}$ th of an inch long, with a folded spermatheca occupying the posterior half of the body, and terminating externally at the anus, where it is provided with two projecting conical copulatory appendages. The female is half as long again as the male, and nearly the whole of its posterior two-thirds is occupied by the ovarian tube, which contains the eggs, and which terminates in an external orifice or vulva, at the anterior fifth of the body. At this time fecundation takes place by union of the sexes, and the female, at the end of seven days from the introduction of the trichinous food, begins to produce living embryos, which are discharged successively from the vulva into the surrounding cavity of the intestine. The production of these embryos is very abundant. According to Pagenstecher, it is often possible to count 500 or 600 at one time, fully formed or in process of development, in the body of a mature female; and as the generative act continues for at least a week or ten days, it is possible that each female trichina gives birth in the intestine to 1000 or 2000 living young.

The embryos, when discharged from the body of the female, are rather less than $\frac{1}{200}$ th of an inch in length, nearly straight, and tapering somewhat toward the anterior extremity. They immediately begin to penetrate the walls of the intestine and disperse themselves over the body. They have been found under these circumstances in the sub-

stance of the intestinal walls, in the mesentery, the diaphragm, the peritoneal and pleural cavities, and thence outwardly in all the voluntary muscles of the trunk and limbs. Their passage takes place quite rapidly, as they may be found in the diaphragm of the rabbit on the eighth to the thirteenth day after feeding with trichinous food, and on the fifteenth or sixteenth day in the muscles generally. On their first arrival in the muscular tissue they are apparently quite free, and capable of moving slowly from one point to another; but they soon afterward become enveloped in a closed capsule or cyst, and there grow to a larger size. As they increase in length within the confined space of the cyst, they become gradually coiled up, thus assuming the spiral form characteristic of the encysted worm. They are then shut off from immediate contact with the surrounding tissues, and pass at once into the quiescent condition.

This process of the development of adult trichinae in the intestine and the dispersion of their young throughout the system produces in man and animals a severe and often fatal illness, known as *trichinosis*. Its earliest symptoms are those of intestinal irritation, caused by the growth and activity of the ingested worms—namely, abdominal pains, nausea, vomiting, and diarrhoea. There is also fever and loss of appetite. Then follows an edematous swelling of the face, body, and limbs, with muscular pains and tenderness, especially on motion; so that the patient lies helpless, with the arms and legs in a semiflexed position, and any attempt at either active or passive movement causes suffering. This corresponds with the period of dispersion of the embryonic worms and their establishment in the muscular tissue. There is also marked difficulty of chewing and swallowing, owing to the invasion of trichinae into the corresponding muscles; hoarseness or loss of voice, due to their presence in the laryngeal muscles; and even in some cases serious disturbance of respiration, from a similar affection of the diaphragm and the intercostals. The fecundity of the adult worms, and the abundant emigration of their embryos into the muscular system, are fully sufficient to account for these symptoms. In man, after death from trichinosis, there have been found in the same subject in the gastrocnemius muscle of the leg 30,000 young trichinae to the cubic inch; in the biceps muscle of the arm, nearly 70,000; and in the deltoid muscle at the shoulder, over 90,000 in the same space. The severity of the disease, other things being equal, is in direct proportion to the quantity of trichinous food ingested and the number of living parasites which it contained. In severe cases

death may take place within the first two days, from the intensity of the diarrhoea and febrile disturbance. More commonly, the fatal termination occurs in the fourth or fifth week. If the patient survive this period, the chances of recovery are much increased, as the parasites have then become encapsuled and are passing into a state of quiescence. When this is accomplished, the morbid symptoms gradually subside, and the patient is restored to a comparatively healthy condition. The encysted trichinae, however, remain imbedded in the muscular tissue for very long periods, and it is not known whether they ever entirely disappear. They have been found in a man eighteen years after the attack produced by their invasion.

The source of this infection for man is almost invariably trichinous pork; for although the rabbit, the cat, the rat, the mouse, the sheep, and the calf are all susceptible to the disease, as proved experimentally by feeding them with trichinous flesh, yet in the sheep and calf it is only exceptionally produced under these circumstances, and never shows itself spontaneously either in them or in the rabbit. It could not be produced in any of the birds experimented on by Pagenstecher—namely, the common fowl, the turkey, the pigeon, and the goose—nor in frogs or newts, nor in several species of invertebrates. The only animals in which it occurs spontaneously and frequently are the rat and the pig; and the latter has been the source of infection for man in every instance thus far known. The disease, as affecting the human subject, is most frequent in Germany, owing to the habit among certain parts of the population of eating ham, sausages, and even fresh pork, in an uncooked condition. Within twelve years after the first recognized case, which happened in Dresden in 1860, there were eleven recorded well-marked local epidemics, of which the most disastrous was that at Hedersleben in 1865, where, out of 2000 inhabitants, over 300 were taken sick and 101 died. In the U. S. it is rare, occurring mainly in isolated cases or among members of a single family who have partaken of the same food.

The danger of infection by trichinosis consists in taking as food pork which is imperfectly cooked. The *fat* of pork is not injurious in this respect, as the adipose tissue never contains trichinae. But the muscular *flesh* in any of its varieties, as fresh pork, ham, sausages, or the lean parts of bacon, is liable to produce the disease. The pig from which the meat is taken may have long since recovered from the original attack, presenting a perfectly healthy appearance when brought to the slaughter-house, and the parasitic cysts are usually too minute and

transparent to attract the attention of the butcher or the provision-dealer. Neither pickling nor smoking, as ordinarily practised, will destroy the vitality of the trichinæ, and they may be found still living in ham or bacon cured by either process. The only protection is that afforded by thorough cooking. The trichinæ are killed by a temperature of 160° F., and meat which has been subjected for a short time to this temperature is harmless. Care must be taken, however, that *all parts* of the meat used be heated to the requisite point, otherwise it is as dangerous as if the whole of it were taken raw.

A ham, if boiled for a short time, may be raised to a much higher temperature than 160° on the outside, while its internal parts are still below that point; and fresh pork which has been roasted or broiled may be thoroughly cooked externally, but still red and juicy within. The only safe rule to follow is that the fresh meat should be broiled or roasted until its color is changed throughout, and that for hams the boiling should be continued until the internal parts are perceptibly softened as well as the exterior. Since, in some instances, trichinæ have been found in pigs slaughtered for the market in so large a proportion as 1 in 50, these precautions are indispensable for protection from the disease.

A further consideration of importance relates to the source of infection for the pig itself. Since this is practically the only animal from which man contracts the disease, if trichinosis could be prevented or extirpated in the pig, the human subject would also be free from it. But as the encysted muscular parasite, whether in man, the pig, or the rat, is always quiescent and sexually unproductive, it is not fully evident how the continuation of its species is provided for. No doubt rats are often contaminated by each other, since they are well known to eat each other's flesh when deprived of ordinary supplies of food; and the cat is naturally infected by devouring rats and mice. But as the pig neither feeds upon human flesh nor habitually upon rats, it is not easy to see why the affection should be so frequent among swine, or how it is perpetuated and transmitted from one to the other. There are probably two modes in which this takes place: First, nearly all slaughter-houses are the abundant resort of rats, which feed upon the refuse material, and thus after a time often become trichinous. During the first period of intestinal irritation in these animals some of the adult worms may be discharged with the evacuations, and accidentally mingled with the food of the remaining pigs. It is possible, also, that pigs may occasionally seize and

devour rats dead or dying from trichinosis. Secondly, the waste bits of flesh and the general debris of slaughter-houses are sometimes, when removed by washing, allowed to run into the feeding-troughs; and lastly, the flesh of a pig dead from incidental causes, and therefore not considered as fit for the market, may be used as food for the remainder of the drove. In some or all of these ways a certain number of swine may be annually contaminated, and thus serve to perpetuate the disease. The methods, accordingly, which are most likely to reduce its frequency, and, if possible, to exterminate it altogether, are—first, the maintenance in slaughter-houses of extreme cleanliness, no waste material being permitted to remain over night to serve as an attraction for rats, nor allowed to mingle with the food of the remaining pigs; and secondly, swine should never be fed with the flesh of one of their own species which has died from injury or disease.

Trichiniasis, or **Trichinosis**, a disease induced by eating the trichinous flesh of swine. (See *TRICHINA SPIRALIS*.)

Tubercle [Lat. *tuberculum*], a name applied to certain diseased and degenerative products in the animal body, and chiefly interesting in its relation to pulmonary phthisis or consumption. In the remote periods of medicine persons dying of consumption were known to have in their lungs yellow masses of cheesy consistency. These were rudely designated tubercle. By Stark in 1785, by Matthew Baillie in 1794, and Boyle in 1810, a new body was described, termed milary tubercle; this minute body, about the size of a millet-seed, of gray color, semi-translucent, and of gelatinous consistency, has come to be regarded as true tubercle. The milary or true tubercle is therefore to be looked for in the acute tuberculous of children, in tubercular inflammation of the brain, pleura, peritoneum, and wherever in a consumptive and tainted constitution acute marasmus supervenes. The yellow masses, now known as crude tubercle, have been resolved by the microscope into wasted, shrivelled cells and fatty granules, which give the homogeneous cheesy consistency. Hence, so-called "yellow tubercle" may be the second and advanced stage of true tubercle, or the "fatty degenerative," retrograde stage of innocuous material in the body, as when acute inflammation has given rise to plastic lymph, which fails to organize. Under such circumstances, in a person hitherto healthy, with no tubercular tendency, an unfortunate inflammatory attack may lead to deposits which become fatty or "cheesy," and these caseous masses liquefy or soften, forming cavities.

It is, then, the tendency of abnormal deposits, whether true tubercle or simple cheesy matter, to compress the healthy tissues and cause their waste, and to soften and form cavities, that leads to consumption and death. Yellow tubercle is most liable to develop, following acute sickness, in those who are delicate and ill-nourished. The relation of miliary or true tubercle to the scrofulous or strumous diathesis is unsettled, the opinion steadily gaining that "scrofula is the soil in which tubercle grows." Buhl, Schuppel, and others claim that tubercle develops upon the minute lymphatics which permeate all the structures of the body. (See CONSUMPTION and SCROFULA.)

Tuber'cular Meningi'tis. See MENINGITIS.

Tu'mor [Lat., a "swelling"], in pathology, is defined by Boyer as "any preternatural eminence on any part of the body," but in a narrower sense swellings which are the recognized results of inflammation and extravasation are excluded. Tumors are primarily divided into two great classes, malignant and non-malignant tumors. To the first belong all the numerous varieties of cancer, epithelioma, and the various canceroid diseases. (See CANCER.) To the second class (benign tumors) belong a vast number of varieties, the classification of which is difficult. A convenient mode is that which classes them according to the tissue of which they are composed. They may be arranged as follows: (1) Fibrous, fibroid, and connective tissue tumor, fibroma; (2) fatty tumor, lipoma; (3) cartilage tumor, chondroma; (4) bone tumor, osteoma, exostosis; (5) muscle tumor, myoma; (6) nerve tumor, neuroma; (7) erectile, cavernous, or blood tumor, angioma; (8) the so-called sarcoma, or flesh tumor, which, according to Billroth, consists of developmental connective tissue which does not become perfect bone-cartilage or other tissue, but undergoes some one or more of several peculiar degenerative changes; many varieties are noted: (9) lymphoma, or hypertrophy of the lymphatic and other ductless glands; (10) papilloma, or hypertrophy of skin elements; (11) cystoma, hollow or cystic tumor, containing a fluid or semi-fluid mass. It may be observed that many tumors combine the characters of two or more of the above classes, and also that, according to a prevalent doctrine, many apparently benign tumors approximate and may finally take on malignant characters.

Ty'phoid Fe'ver. See TYPHUS AND TYPHOID FEVERS.

Ty'phus and Ty'phoid Fe'vers [*typhus*, from Gr. *τύφος*, "stupor;" *typhoid*, from Gr. *τύφος*, "stupor," and *εἶδος*, "form"], two idiopathic or essential continued fevers, by some au-

thorities regarded as a greater and lesser degree of one common disease, but by a majority of physicians conceded to be distinct diseases with certain resemblances. Typhus is the more acute, virulent, and fatal, the more sudden and pronounced in its onset, rapid in its course, and in cases of recovery terminating promptly by a crisis. Typhoid is insidious in its development, less abrupt in its onset, slower in the development of its symptoms, which are less acute, and terminates by a prolonged and gradual convalescence. Typhus is known as ship-fever, jail-fever, camp-fever, etc., being the product of vast aggregations of humanity under unhygienic conditions, especially deficient ventilation; so that the rebreathing of air loaded with emanations from crowded living beings is its chief cause. With the sanitary reform of barracks, ships, prisons, etc. it has been reduced to a minimum. Typhoid fever is far more prevalent, occurring in all countries, among all classes of society, in isolated and healthy country villages as well as in the larger towns and cities. It has variable degrees of severity, and a variable predominance of different classes of symptoms in different persons and seasons. It may be induced by purely external causes, as by bad ventilation, sewer-gas, exhalations of decomposing matter in cellars or near houses, privies, and especially the contamination of drinking water, as when springs or wells receive by percolation the surface-water from outbuildings. In other cases typhoid fever would seem to have a purely intrinsic origin, the morbid matter being collected within the person's system by deficient elimination. Thus, it is induced in persons of nervous temperament by prolonged and excessive mental or bodily effort, care, exposure, fatigue, and privation of food. The nervous type is then developed, justifying the German designation of "nervous fever," since the depressed nervous system suspends the nutritive processes of the body, and effete matter becomes present in excess of the nutritive supply. Typhoid fever is also known as adynamic and asthenic fever, indicating the peculiar exhaustion characterizing it; pythogenic fever (Gr. *πύθος*, "filth," and *γενᾶω*, to "generate"). In typhoid fever the Peyer's glands of the small intestine are invariably swollen, infiltrated with typhoid matter, and often ulcerated or sloughed out; hence from this specific lesion the disease is also called enteric fever, abdominal typhus, and ileo-typhus. Typhus fever has an average duration of two weeks, characterized by initial chill, active delirium, contracted pupil, dark-coated tongue, dusky suffusion of the face, a high temperature, a rapid and feeble pulse,

and often weak heart-sounds. The body-heat rises steadily, remains constant at its height, when at the end of the second week speedy recovery ensues, with profuse perspiration, or the case becomes more serious or fatal. Exceptionally, the relapse is terminated by a crisis as late as the end of the third week. Typhoid is of longer duration—at least three full weeks of the active fever, and several weeks of gradual convalescence. During a week to ten days antecedent to the actual attack the specific poison or *materies morbi* is incubating, and the patient is languid, feeble, and depressed. It is ushered in by headache, chill or chilliness, and elevated temperature; later, follow muttering delirium, semi-consciousness or "coma-vigil," wild excitement and tossing of the body, picking of the bedclothes; the face is suffused and blank, the tongue coated; the teeth may have "sordes," a deposit of blackened and dry saliva; the abdomen is tender on pressure, tumefied, and emits a drum-like sound when percussed; the bowels are often loose, the stools being "ochre-colored," and often found to contain the shreds or entire body of sloughing intestinal glands; in the second week in many cases minute spots appear on the lower part of the chest and upper part of the abdomen, coming in crops of twelve or more, each crop lasting about three days. The temperature, as shown by the medical thermometer, has a peculiar and almost diagnostic course in typhoid fever. There is after the initial rise an ascent for four or five days of about 2° F. each evening, and a descent in the morning of 1° F., making a daily gain of 1° F. Thus, the temperature reaches 103°, 104°, 105° F.; it then remains nearly constant for several days, when toward the end of the second week it has a gradual descent in the same manner of a degree daily; during convalescence there is a marked daily variation of temperature, resembling intermittent fever—an evidence of the debilitated and susceptible state of the convalescent, and of the periodic efforts of the recuperating system to cast off morbid matter. The modern treatment of typhus and typhoid may be summed up chiefly as good nursing, fresh air, food, and support by tonics and stimulants. Cold water may be of the greatest value, either sponging, the cold pack, affusion, or immersion, to reduce the unusually high and dangerous temperature of the body. (See article FEVER.)

Ul'cer and Ulcera'tion [Gr. *ἔλκος*; Lat. *ulcus*], the process of molecular death or disintegration occurring on the surfaces of the body at points where nutrition is low in consequence of local irritation or injury or

defective circulation and bad states of the blood. Localized inflammation is often the determining cause of an ulcer, by locally occluding the capillaries and arresting or weakening local circulation and nutrition; thus, the canker is often an ulcer in the mouth due to stomatitis; the ulcerated tonsil has been previously inflamed, either acute or chronic. Sluggish venous circulation often causes ulcers, as ulcers upon the legs from varicose veins or weak circulation of the aged; ulcers upon hemorrhoids or varicosity of the anus. When wounds have failed to heal promptly, their border and surface may take on the ulcerative process, and become bathed with a weak watery serum containing black granular detritus. The presence of foreign substances, as a splinter in the flesh or dead bone in a limb, creates secondary ulcers. Pressure and constant irritation are causes, as upon the feet from ill-fitting boots, and bed-sores from long lying. Lowered nerve-tone and depressed temperature favor ulceration, the paralyzed limb easily ulcerating. Ulcers are classed as—(1) Simple or healthy ulcers, if the term is not a misnomer—that is, ulcers having a healthful tendency to heal. (2) Weak ulcers, lacking the florid color and healing tendency of the first class; they often result from the debilitated health of the subject. (3) Indolent ulcers; often all recuperative power is lost; usually the border is thickened and elevated, and may be indurated. (4) Irritable ulcers are painful, and may bleed upon touch. (5) Inflamed ulcers. Ulcers are liable to become inflamed upon slight local irritation or derangement of the blood, use of alcohol, and exposure to cold. (6) Sloughing ulcers, conditions often following the inflamed ulcer or very low states of health. (7) Serpiginous ulcers, when some specific vice of the blood gives it a tendency to spread, and it pursues a tortuous, serpentine course. (8) Specific ulcers, with undermined edges, due to primary deposits beneath the skin, which soften and discharge upon the surface.

The simple ulcer needs simply to be kept clean and protected by any bland cooling lotion or ointment; the weak and indolent requires stimulating applications; the indurated often requires the incision of its thickened borders or removal by strapping with plaster; the elastic bandage will effect a speedy cure in many cases; the inflamed ulcer calls for cold and evaporating lotions—the sloughing for antiseptics. In all forms the diet must be rich, the appetite maintained by tonics, and the blood enriched by iron and often alteratives.

Umbil'ical Her'nia. See HERNIA.

U'rinary Cal'culi and Depos'its. *Deposits.*—Urine in disease often deposits on stand-

ing various kinds of sediments, which differ in properties and composition according to the causes which induce their formation. Both morphological and chemical bodies are thus separated. The former class includes such substances as blood, pus, and mucus-corpuscles, epithelial scales, spermatozoa, etc.; to the latter class belong urates, uric acid, phosphates, calcic oxalates and carbonates, hippuric acid, cystine, leucine, xanthine, tyrosine, etc. These deposits form light flocculent powders or compact grains (*gravel*), or they collect in larger concretions, forming calculi. The most common sediments contain uric acid. This often separates in a free state, forming *red gravel*, or it is deposited in the form of ammonic or sodic urates, which sometimes appear in perfectly healthy urine. A crystalline or amorphous deposit, consisting of ammonio-magnesian phosphate, forms what is known as *white gravel*.

Calculi in the Bladder.—These vary greatly in size and composition, and are frequently composed of concentric layers of different composition, arranged around a clot of blood or a foreign substance as a nucleus: the exterior layer is often phosphatic, but never uric, in character. The most typical forms have the following composition:

<i>Uric.</i>	
Uric acid.....	92.8
Urates.....	3.2
Extractive matters.....	1.0
Water.....	3.0
<i>Phosphatic.</i>	
Sodic urate.....	9.77
Calcic phosphate.....	34.74
Ammonio-magnesian phosphate.....	38.35
Calcic carbonate.....	3.14
Magnesian carbonate.....	2.55
Extractive matters, etc.....	6.87
<i>Oxalic.</i>	
Calcic oxalate.....	63.5
Calcic phosphate.....	6.2
Water and organic matters.....	30.3

As a rule, the oxalic calculi are the hardest, the phosphatic being the softest. The following are the best characterized forms of calculi: *Uric acid calculi*, of a brownish-red color and smooth surface. When heated they fuse, and emit a peculiar odor, leaving but a little ash. They give the reactions for uric acid. *Ammonic urate calculus* is rare in occurrence. It is more easily soluble in water than the preceding, and dissolves in hot potassa solution, with evolution of ammonia. *Calcic oxalate* constitutes the *mulberry calculus*, which has a dark-brown color and is very hard. When heated before the blow-pipe, it first blackens, then burns to a white ash consisting of calcic carbonate. It dissolves in hydrochloric and in nitric acids, but not

in acetic acid. *Calcic phosphate* forms the *bone earth calculus* ($O_6P_2Ca_3$), which is of rare occurrence, and often consists of laminae of crystals radiating from a nucleus. It is of a light-brown color, dissolves in hydrochloric acid, but is infusible before the blow-pipe. *Ammonia-magnesian phosphate*, or *triple phosphate calculus* ($O_8P_2Mg_2Am_2$), is white and brittle; fuses with difficulty, emitting an ammoniacal odor, and readily dissolves in acids. *Fusible calculus*, which appears to be a mixture of the two preceding varieties, forms white friable masses which often acquire a large size. It fuses readily, and is easily soluble in acids. *Xanthine calculi* are of a pale-brown color, have a lamellar fracture and a polished surface, which acquires a high lustre when rubbed. They dissolve in potash solution and in nitric acid, but very sparingly in hydrochloric acid. *Cystine calculi* are semi-transparent, and have a dark-yellow color and a crystalline texture. The last two forms are of unfrequent occurrence. *Compound calculi*, consisting of a succession of laminae composed of several of the foregoing varieties, also occur. (See article CALCULUS OR STONE.)

U'rine, Reten'tion of. See RETENTION OF URINE.

U'terine Diseases. Diseases of the womb or uterus, so-called "female diseases," are comparatively infrequent in the women of aboriginal and savage tribes, and in civilized races among the women of rural districts who labor, are much in the open air, and free from artificial and effeminate habits of dress and living. For the most part they exist in delicate women, those whose health is impaired by some other and primary disease, and relatively more often in women resident in great cities. The predisposing causes of a majority of all uterine diseases are the constant recurrence during the greater part of adult life of the menstrual period, the complications and sequelæ of child-bearing, and the intimate nervous and vascular sympathy connecting the uterus with every part of a woman's organism. Uterine diseases comprise also the derangements of the appendages of the uterus—the ovaries, vagina, and peri-uterine connective tissue and ligaments which maintain the organ normally *in situ*. The uterus is subject to congestion and to inflammation from many causes, as suppressed menstruation, catching cold, falls, blows upon the abdomen. Congestion and inflammation are indicated by a sense of fulness, weight, warmth, and pain, with tenderness on pressure in the lower part of the abdomen, especially in standing or walking; and relieved by lying down. The disease may be limited to the inner

mucous membrane, to the body of the organ, or the exterior investing loose tissue, or rarely involve all. The term metritis denotes inflammation of the body proper of the organ, endo-metritis of the mucous interior, peri-metritis of the surrounding elastic tissues which fill the cavity of the pelvis. This tissue, when extensively inflamed, is often infiltrated with new plastic matter, the product of the vascular engorgement, and this, becoming set, "fixes" the uterus for a time, so that it is rigid and immovable—a condition termed pelvic cellulitis and peri-uterine cellulitis. This loose tissue is occasionally the seat of profuse hæmorrhage from a ruptured vessel, as in lifting, jumping, or falling. The effused blood remains fluid or semi-fluid, and gravitates in the pelvis; this blood-tumor, termed "pelvic hæmatocele," often presents in the vagina.

The normal uterus is a symmetrical organ, with a straight axis, and the cavity of its body and neck slightly open; its normal position is that of slight anteversion, or upright, and from above inclining slightly backward. But attacks of congestion and inflammation change its shape, size, symmetry, and position. Thus, either from external pressure or adhesions, or from softening or thickening of its own walls, it may be drawn down—either backward, forward, or to either side; the organ as a whole may be tilted, giving rise to "version;" or the body may be bent on the neck, a condition termed "flexion." According to the direction which the displacement or deformity of the uterus takes, we have anteversion, retroversion, right and left lateral version, and anteversion, retroflexion, and right and left lateral flexion. Flexions of the uterus are a common cause of "dysmenorrhœa," or difficult menstruation, since by the bending of the uterus its canal is bent and constricted, and the free escape of menstrual blood is prevented; this flexion of the uterine canal is also a cause of sterility, since seminal elements cannot enter the organ and produce conception. Whenever the uterus is enlarged, as by congestion or inflammation, is the seat of a polypus or tumor, or is pressed down by growths in the cavity of the abdomen, and also whenever in debilitated persons its ligaments and outside supports are weakened and relaxed, it tends to gravitate below its natural position in the pelvis, and even to project from the body. This "falling of the womb" is termed "prolapse," and, when extreme, "proeidentia." The lower end of the uterus, the neck or cervix, is often ulcerated as the result of congestion, inflammation, contact of its end with the floor of the pelvis, and the irritation of the acrid mucus discharged in endo-

metritis. Tumors may develop within the cavity of the uterus, in the substance of its walls, or upon its outer surface, either beneath its serous covering or loosely attached by pedicles. The uterus is occasionally the seat of cancer, and chiefly at the climacteric period or "change of life." The ovaries—whose functional work, the production and periodic discharge of the ovules, is the paramount physical feature of woman's sex—are subject to attacks of congestion, inflammation, hæmorrhage, and intense neuralgia. The fibrous framework of these organs may increase and develop fibrous tumors; but especially frequent and important are "ovarian cysts" or "ovarian dropsy." The ovaries become distended with fluid in order to rupture and eject the ovule; it then, again, is filled by the serum of the coagulated blood from the hæmorrhage consequent upon the rupture. The ovaries are liable to fill, and by a process of vascular activity and growth in its wall becomes a cyst of greater or less size: cysts may be present of small size and in numbers never attracting attention, or, reversely, grow either by secretion or dropsical transudation to contain ten, twenty, sixty, or more pounds of serous fluid. Such ovarian cysts may be single sacs, or divided by partitions into compartments. The broad ligaments on either side of the uterus less often are the seat of dropsical cysts developed between their folds. The vagina, the intervening passage which connects the surface of the body with the womb within, is the frequent seat of catarrhal inflammations, in which mucus is more or less profusely secreted, causing a discharge termed "leucorrhœa" (Gr. λευκός, "white" (matter), and ρεῖν, to "flow"). It may also be acutely inflamed, "vaginitis;" the seat of ulcers, and also of spasm, with or without pain, a condition termed "vaginismus." This passage is, very exceptionally, anatomically defective, being wholly or partially wanting or constricted. Most common of all uterine diseases are merely functional derangements or irregularities of menstruation. By amenorrhœa is understood absence of menstruation; dysmenorrhœa is characterized by pain, sickness, and deficient flow at the period; and menorrhagia is a prolonged and excessive menstrual flow, or persistent loss of blood from the uterus, as when cancer or polypus exists. In the treatment and cure of uterine diseases correct diagnosis is essential at the outset. True, most of them are benefited by use of general tonics, by rest, corrected habits, and by supporting the abdominal viscera; but many are not even alleviated by these general measures. Physical exploration, both manual and by aid of the speculum, will often reveal an unsuspect-

ed disease, and point to the special topical treatment or surgical procedure which is the essential means of cure.

Vaccina'tion [Lat. *vacca*, a "cow"], the inoculation of the human being with vaccine or cowpox, to protect against smallpox or variola. Jenner discovered vaccination in 1796. He had previously observed that milkmaids who contracted the pustules of cowpox in their hands while milking cows affected with vaccinia did not have smallpox. He further demonstrated that vaccine virus, when "humanized"—*i. e.* transmitted from arm to arm through many persons—preserves its protective efficacy against smallpox. Vaccination has replaced inoculation (with virus of smallpox), and is now generally practised in all civilized countries. In many it is obligatory; in England every infant must be vaccinated before three years old. Vaccination has had the result (1) to reduce the prevalence of smallpox to a minimum. In centuries past a majority of persons had it, and 30,000 persons have died in one year of it in Great Britain; now but a few hundred. (2) To diminish the danger of individual attacks, as the type of the disease has been rendered mild by hereditary influence of vaccination. Exceptionally, the disease attacks the vaccinated, but in a mild form, varioloid. There is no danger of transmitting disease by vaccination (1st) if only cowpox, which has never entered the human body, be used; (2d) if in using humanized virus—*i. e.* taken from a child's arm or the scab—healthy children only are used as agents of transfer; and even in doubtful cases if only vaccine lymph, free from blood, is taken. Vaccination is usually performed on the arm, at the insertion of the deltoid muscle. The Spanish vaccinate girls on the leg, to avoid the scar on the arm. Vaccination should be carefully performed with a clean lancet or needle. The vaccination matures on the eighth day—a circle of white vesicles with a red congested base or areola. Jenner said it looked like pearls on a rose-leaf. After the eighth day there may be much swelling and soreness, and a scab forms, to drop off on the twenty-fourth day. Vaccination had better be done by a physician, and never near the joints, as serious results follow from inflammation. Vaccination should be repeated once in seven years until mid-life. Physicians, nurses, and other exposed persons should be vaccinated more often. When a person has been directly exposed an immediate vaccination anticipates smallpox, as that disease has twelve to fourteen days for incubation.

Var'icose Veins, relaxation of the coats of the superficial veins, with increased calibre, occurring most frequently in the lower

extremities. Gravitation, the weight of the venous blood-column above, and the difficulty of the ascent of blood from the feet to the body, determine the greater frequency of the disease in the veins of the legs. Varicose veins are common in aged men, the result of senile degeneration of the various tissues, including attenuation of the coats of vessels; less often it occurs in mid-life to robust men of the gouty habit, and who by vocation are constantly standing; walking does not favor the condition, since the movements of the superficial muscles and tension of the integument help to lift the blood upward. Even in youth violent exercise, as in the gymnasium, by unduly taxing the tension of the vascular system, causes a breaking down of the valves in the veins and venous dilatation or varicosity. In women the chief and not unfrequent cause is pregnancy. Women who have borne several children will often have marked varicose veins, the result of the pressure of the gravid uterus upon the veins in the pelvic cavity, and consequent detention of the venous blood in the lower extremities. Varicose veins occur exceptionally in other parts of the body—upon the scalp and side of the neck, and upon the abdomen in the region of the groin. Varicocele in the male is a local varicosity of the spermatic veins. Hemorrhoids or piles are due to repeated passive congestions of the hæmorrhoidal veins at the verge of the anus; obstruction to the portal circulation is the primary cause, but if of frequent recurrence and long standing the veins become varicose. Varicose veins, as seen in the lower extremities, are increased in diameter with inequalities of calibre, and present nodular enlargements or pouches at intervals; there are greater relaxations at the site of former valves or at the points of division of veins. The veins are also tortuous, since the longitudinal fibres of the coat are relaxed no less than the circular; the tortuosity accommodates the increased length of the vessel and favors the ascent of the blood. Varicose veins when appearing do not necessarily indicate debility or degeneration, but should warn the patient at once to abandon vocations involving violent exertion, to habitually regulate the diet and bowels, and neutralize and remove any rheumatic or gouty vice. The varicose limb may be benefited by daily friction, cold effusion, and salt bathing. But the extension of the disease is best checked, and the best prospect of cure ensured, by constant external support. This is secured by uniform bandaging, or by wearing an elastic stocking or laced leg-corset. The elastic stocking, made of rubber webbing, is of the greatest value to those who can afford the silk and rubber webbing and

keep them constantly renewed when stretched by wear. The inferior stocking by stretching at points leaves bands of circular constriction which aggravate the disease rather than give the intended benefit. The cheapest and most efficient appliance is a case or corset of strong jean fitted to the shape of the limb and lacing up in front. Varicose veins are radically cured by ligation and by hypodermic injection of a drop of liquor ferri-pernitratris within the vein. The latter method, carefully performed, may afford permanent relief, with the precaution to tightly bandage the part for several hours to prevent blood-clots from reaching the heart. Arsenical preparations act well on varicose veins.

Va'rioloid. See SMALLPOX and VACCINATION.

Vene'ral Diseases. See BLENNORRHEA, CHANCRE, GLEET, GONORRHEA, STRICTURE, SYPHILIS.

Ven'om [Lat. *venenum*], the poisons elaborated by healthy animals as distinguished from *virus*, the virulent liquid product of disease in animals or man. Some insect stings are virulent, though as a rule they are mild and relieved by simple measures. Bees and wasps as a rule leave their sting in the wound they inflict; this should be extracted, the wound protected from the air or bathed in cooling and stimulating evaporating lotions; ammonia is a useful application. The scorpion is dangerously venomous in the tropical regions of the Indies and Africa, but in the milder climates it inhabits does little harm. Contrary to the fabulous accounts of the tarantula venom, it rarely causes death, and seldom causes alarming symptoms. In all countries there are venomous serpents, their number diminishing with increase of population and high cultivation of soil. Islands are comparatively free. Ireland is said to be quite free, and England has but one, the viper. The chief venomous serpents of the U. S. are the rattlesnake, moccasin, and adder. The phoora of India and the cobra are exceedingly virulent. The venom of serpents is elaborated in special glandular apparatus adjacent to the mouth, stored in a sac or canal, and reserved for sudden voluntary ejection as a part of the reptile's means of self-defence. The effect of the poison upon man may be immediate, rapid, and speedily fatal, or slow and incomplete. The venom, which probably has definite living germs, a *contagium vivum*, is believed to rapidly multiply itself in the blood, and quickly pervades the entire body, vitiating the red corpuscles and the nutrition of the tissues. In some cases the nerve-centres are primarily attacked, various nervous phenomena being speedily followed by paralysis of the medulla ob-

longata, and death. More often a definite period, short or long, intervenes before death. A prickling, burning pain is felt in the wound, increases to intensity, and extends to adjacent parts. The limb or part swells and inflames (phlebitis), and as a result of obstructed circulation the part becomes speedily œdematous or dropsical, and assumes a variety of changed colors from disturbed circulation and the decomposed state of the blood—from dark red to livid white, to blue, purple, mottled, and leaden hue. The limb may become cold, and, if life is not destroyed, in time slough away. These changes may extend over the entire body. The mind is anxious, depressed, often deranged. Breathing is embarrassed, there is profuse sweating, vomiting, and jaundice, and death occurs by paralysis of the nerve-centres or exhaustion.

Venomous wounds should at once be cleansed, encouraged to bleed freely by suction or excision, a ligature speedily placed on the limb, or the part sedulously rubbed toward the wound and away from the centre of circulation, to evacuate all contaminated blood. Bold and thorough cauterization is of value. Strength is to be kept up by the heroic use of alcohol, ammonia, and other stimulants. (See POISON OF SERPENTS.)

Ver'mifuges [Lat. *vermis*, "worm," and *fugare*, to "cause to flee"], also termed **Anthelmintics** [Gr. *ἀντί*, "against," and *ἐλμυς*, "worm"], also **Helminthagogues** [Gr. *ἐλμυς*, "worm," and *ἀγων*, to "lead" or "expel"], remedies intended to remove worms from the stomach and intestines, and prevent their recurrence by the destruction of their germs. Properly they are to be distinguished as *vermicides*, or those which kill the worms, and *vermifuges*, those remedies which by moving the bowels violently or by their rough or irritating qualities dislodge and bring away the entozoa alive. The remedy that is destructive to the worm must at the same time be innocuous as regards the patient, and not injurious to the alimentary tract. Remedies which simply stupefy or destroy the worm must be followed by the exhibition of an efficient purgative to remove the destroyed parasite, as well as to demonstrate the success of their action. Pink-root (*Spigelia marilandica*) is well known, and for children much used in the form of fluid extract of spigelia and senna. The oil of wormseed (*Chenopodium anthelminticum*) is employed, as is *Spigelia*, against round worms. For the same purpose, and preferable, is santonine, the acid extract of *Santonica* or Levant wormseed (*Artemisia contra*). It is pleasantly administered in flavored lozenges; may be given at night, followed by cathartics in the morning. Cowhage (*Mucuna pruriens*) is less

used than formerly. Thread-worms are usually in the lower bowel, and easily removed by enenata of salt and water, aloes in milk, or any irritating or astringent material in solution. The removal of tapeworm is often difficult. Remedies should, as a rule, be preceded by free evacuation of the stomach and bowels by cathartics, and little food taken at the time. The best opportunity is thus given to dislodge the head, which adheres by tentacles or hooklets; for, though many yards of the worm be evacuated, except the head be obtained there is no cure. The chief remedies for tapeworm are pumpkin-seeds broken up and given in an electuary of sugar or emulsion of water or milk, followed by a purge; turpentine in emulsion of acacia muelleage and castor oil; decoction of pomegranate; the oil of male fern (*Filix mas*); and, preferably, koussou (the flowers and fruit of *Brayera anthelmintica*, a tree of Abyssinia). It is efficient, yet safe to the patient, and gives little inconvenience. Each morning half an ounce of the powdered flowers is taken in water, or 20 to 40 grains of the active extract, *kousine*, may be taken in a wafer. No purge is necessary; watery stools are produced, and the worm is discharged dead. (See ANTHELMINTICS.)

Ver'tigo [Lat.], a subjective or apparent impairment of the equilibrium of the body. It assumes two principal forms: In one it appears to the subject as if the objects in his vicinity were whirling about him; in the other, he fancies that he is forced to fall in some definite direction, forward, backward, or to either side. Vertigo is rarely if ever continuous, but occurs in paroxysms provoked by some appreciable cause, as changing posture, eating, using the eyes, etc. The subjects of vertigo often stagger or fall in consequence of the sensation of motion. Vertigo is sometimes the expression of disease of the brain, or of interference with the circulation of blood in that organ, but more usually it is a sympathetic disorder, caused by indigestion, anemia, sudden impairment of parallelism between the two eyes, disease of the internal organs of hearing, etc. Vertigo may be artificially produced by the administration of stimulants (alcohol), and by the application of galvanism to the head in a transverse direction or to the superior ganglion of the cervical sympathetic nerve. A variety of subjective unsteadiness, without definite direction to the apparent movement, is better designated as dizziness. Temporary relief is given by alcoholic stimulants, ammonia, musk. The proper management of vertigo consists in the treatment of the disease causing it.

Vi'rus [Lat.], animal fluids produced in diseased conditions or by morbid processes,

and capable of developing disease when transmitted to other animal bodies. Thus, man may be inoculated by the virus of human origin, smallpox, syphilis, etc., vaccinia of the cow, glanders of the horse, and rabies canina or hydrophobia. A minute amount of the virus gaining access to the body is sufficient, by self-multiplication, to infect the entire volume of the blood and contaminate every part of the body. Peculiar cells or germs, having temporary vitality and tendency to reproduce themselves (*contagium virum*), constitute the active elements of all viruses. Having gained entrance to the system, they for a time seem dormant, but are really multiplying, and this period is well designated as one of "incubation." Thus, smallpox appears twelve or more days after admission of virus, vaccinia within a week, hydrophobia on an average forty days. There are no specifics against the effects of viruses when once in the system. Hygienic and supporting measures may prepare the body to meet those effects and pass safely through. (See also VENOM.)

Vis'ion, Defects' of. See SIGHT, DEFECTS OF.

Voice, Loss of. See APHONIA and THROAT, DISEASES OF.

Vom'iting [Lat. *vomo*, -*itum*, to "throw up;" see INDIGESTION]. Vomiting is a reflex contraction of the muscular coats of the stomach, ejecting its contents. It is an involuntary and spasmodic act. Vomiting may be the result of disease of the brain, of the pneumogastric nerve, of the walls of the stomach, of catarrh or inflammation of its mucous lining; it may be the result of indigestible food, bile or mucus in the cavity of the stomach, or a sympathetic reflex result of disease in other organs, as the uterus, ovaries, or liver. The vomiting of pregnancy and of uterine or ovarian disease, the peculiar morning nausea and vomiting of Bright's disease of the kidneys, bilious vomiting, vomiting of gastric catarrh, and the vomiting at the onset of acute fevers and eruptive diseases of children, and vomiting from surgical causes, as fracture at the base of the skull, concussion and inflammation of the brain, are to be distinguished, each from the other, in some instances by peculiar features of the act of vomiting, but more often by observation of the associated symptoms. (See STOMACH, DISEASES OF.) At the onset of vomiting the face may be deathly pale; the surface becomes cool and bathed with clammy sweat; the pulse small and feeble; and great prostration results. In some instances faintness occurs, or even fatal syncope. An occasional accident during vomiting is the impaction of

solid food or artificial teeth in the larynx, causing suffocation. Robust persons, but little depressed by vomiting, become red in the face during the effort, and later are cool and slightly pale. The clothes should be loose when vomiting, fresh air in the room, water at hand for cold affusion to the face if needed. Stimulants may be needed to counteract collapse. Ice, carbonic-acid water, creosote, oxalate of cerium, dilute hydrocyanic acid, are useful remedies.

Vom'iting of Blood. See HÆMATEMESIS.

Warts, or Verru'cæ [Lat. *verruca*, a "wart"], are developed by hypertrophy, abnormal growth, of the papillæ of the skin. They may be round and ovoid or conical, thread-like, or broad and flat. The so-called "seeds" or points of a dry wart correspond to the number of papillæ which have become elongated and thickened. Each papilla of the skin has an independent supply of blood by a little loop of capillary blood-vessels at its base. Hence, mere removal of the wart is followed by its renewal from the well-nourished base and remaining cells which have transmitted the tendency to excessive growth. Cases are often cited of warts communicated by the blood from other warts, but the best authorities deny them. Warts occur chiefly in children, between the second and fourteenth year; their cause is uncertain. Their duration is indefinite; they sometimes disappear suddenly, probably by contraction of the vascular papillary base and casting off of the superabundant dry cells. When they are kept free from handling or irritation, the diet is corrected, and alteratives are given, they may slowly disappear. The common treatment is to snip them off and touch the base with nitric acid, glacial acetic acid, or lunar caustic; saturation with tincture of thujar or thuya (*arbor vitæ*) daily has the effect to speedily remove them in many cases.

Wa'terbrash. See PYROSIS and INDIGESTION.

Water on the Brain. See HYDROCEPHALUS.

Wax'y Degenera'tion, a diseased condition of the tissues of the living body, in which parts of organs are changed into the substance known as lardaceous, or "animal amyloid," a peculiar albuminoid substance which some have tried to identify with the glycogene of the liver. Though an albuminoid, it has reactions somewhat like those of starch. It takes a deep-brown red from iodine, dissolves in warm water, cannot be melted, swells but does not dissolve in sulphuric acid, and does not dissolve in ether. It is apparently isomeric with albumen (*Friedrich and Kekulé*). It has often been

confounded with true starch, with which it is sometimes associated. Organs seriously affected by waxy degeneration, when cut, have a half-transparent look. It has been detected in the brain, nerves, spleen, liver, kidneys, muscles, arteries, bones, glands, adventitious tissues, cancers, and in various other situations. Rickets, syphilis, pulmonary consumption, diabetes, chronic kidney disease, and malarial and mercurial poisoning are among the conditions with which it is associated. It is seldom or never detected during life. The treatment naturally is for the disease with which it is associated. Some cases of obscure and undiagnosed ill-health doubtless arise from this degeneration. Not much that is definite can as yet be said of the causes and treatment. In suspected cases the patient is to be put into the best hygienic conditions, and untoward symptoms should receive attention.

Wen [Ang.-Sax. *wenn*], a cystic tumor occurring upon the surface of the body, especially frequent on the scalp. It originates by the occlusion of a follicle of the skin or scalp, and the subsequent slow accumulation of sebaceous matter secreted by the lining of the steadily-increasing cyst. The tumor, therefore, is round and symmetrical, and, causing a distension of the overlying skin or scalp, is smooth and shiny. It may be soft, semi-solid, or indurated, according as its contained sebaceous matter is fluid, rich in pultaceous fatty granules, or has had its fluid elements absorbed, leaving only inspissated and calcified substance. The wen is a harmless, non-malignant tumor. Whether single or present in large numbers, its removal is easy and harmless. The overlying tissues are to be incised, without cutting into the wen, when with the handle of a scalpel or a small ivory paper-cutter the round, ball-like cyst may be pried or peeled out. If the cyst has been cut into and the cheesy contents evacuated, the membranous sac must be seized with forceps and gently drawn out, for if left it will refill. Once properly removed, it cannot return. (See TUMOR.)

Whites. See LEUCORRHEA and UTERINE DISEASES.

Whit'low, better known as **Felon**, a painful inflammation of the fingers and toes, more often affecting the last joint of the fingers. The felon may arise from a local bruise; more often it is the result of disturbed and deteriorated states of the blood. From the latter causes a number of felons may develop successively. A point of local tenderness and hardness is observed; swelling and induration increase, with persistent, deep-seated pain, at first dull, later more severe, with sense of tension, and ultimately

lancinating and throbbing. The felon involves the periosteum, or fibrous sheath of the bone, and the unusual pain attending this condition is due to the dense and unyielding structure of the part and the degeneration of the inflammatory exudation into pus. The periosteum is usually separated from the bone by the burrowing pus, giving rise to the sense of tension; the bone, so deprived of its sheath and nutritive vessels, is liable to die, dead bone being a frequent sequel of felon. The constitutional disturbance is marked, the result of great suffering, the local injury, and the absorption of pent-up pus into the blood. When detected early, a felon may sometimes be dissipated by an ice-pack or by a small blister; more often it will progress. Early and efficient incision of the point of induration may avert further suffering and prevent the formation of much pus. Poulticing is a slower and painful way of bringing the pus to the surface; it should be evacuated with the knife as soon as detected. Dead bone and stiff joints need never follow felon if opened early. In severe cases anodynes may be needed to secure sleep and allay pain; quinine to sustain strength; and sulphites to correct the blood in recurring felon.

Whooping Cough, a disease generally occurring but once in the life of an individual, and usually during infancy or childhood, is characterized by paroxysms of convulsive coughing, followed by a long ringing inspiration, whence the name. It is the chin-cough of early English physicians, the *pertussis* of Sydenham, and the *coqueluche* of French authorities, and was formerly confounded with the catarrhal affections, which it much resembles in its symptoms and earlier diagnosis. It consists of two elements—a general bronchial catarrh and a peculiar hyperæsthesia or morbid sensitiveness of the air-passages, manifested by paroxysms of protracted coughing, terminated by a whoop. The simple disease is rarely if ever fatal, but when complicated with pulmonary or cerebral disease it is extremely dangerous. Whooping cough demands care in diet, warm clothing, avoidance of exposure to cold and damp, sustaining remedies when the strength flags, and the use of antispasmodic and sedative remedies to allay the paroxysms of coughing. Chloral and bromides are efficient. Quinine in small doses may be given throughout the attack.

Wom'en, Diseases of. See UTERINE DISEASES.

Worms. See articles on ANTHELMINTICS, ASCARIS, TAPEWORM, VERMIFUGES.

Wounds. Wounds are classified according to the nature of the injury, as (1) punctured

wounds, made with pointed instruments; (2) incised wounds, produced by cutting instruments or sharp edges; (3) lacerated wounds, in which the borders of the wound are irregular, ragged, and torn, and the result of great force, dull instruments, or tearing; (4) poisoned wounds, in which either an animal venom or virus or some impure, poisonous, or irritating matter has gained entrance to the injured tissues and contaminated the blood; (5) gunshot wounds, which as a rule are penetrating and may be lacerated, but are peculiar from other wounds, owing to the character of the missile, the shock they give to the part and to the nervous system, and the grave complications to which they are liable. (6) Contusions and "contused wounds" are also classed with wounds, but the contusion is not properly a wound, since there is no actual solution of continuity of the flesh, unless it be an abrasion of the skin; and a contused wound is simply a punctured, incised, or lacerated wound whose borders and adjacent tissue are severely contused. The tissues at the seat of a contusion are often seriously injured, many minute blood-vessels are ruptured, and the escaped blood, settling in the tissues, causes an "ecchymosis," a black or blue-black mottling of the part. As the blood is decomposed and slowly absorbed, this color changes to blackish-green, greenish-yellow, dark leather-color, and lighter shades till it disappears. In other contusions there is subcutaneous laceration of tissues, or such shock to their vitality that they speedily disintegrate, and the devitalized part sloughs in a mass or becomes the seat of ulcers. Punctured wounds are relatively the most serious class, for they are often poisoned by the entrance, if not of venom or virus, of foreign matter, as rust, dust, splinters, clothing, etc., which cause suppuration at the bottom of the deep puncture, and lead to grave inflammation, erysipelas, and contamination of the blood by retained unhealthy pus. The punctured wound is to be well washed, cleansed of all blood-clots and dirt, and if deep or in the vicinity of dense fibrous tissue, as in the hand or foot, or near joints, must be freely cut and converted into an incised wound. Incised wounds heal in several ways. They heal most promptly and simply when perfectly smooth, clean cuts, free from clotted blood, and in the flesh of persons in perfect health. Thus, a clean cut, whose borders do not gape or separate, may, if instantly closed and sealed from the air by plaster or collodion, heal in a few hours, and approximately warrant the designation "immediate union." More often a day or two is required; the wound, being cleansed of

clots or foreign matter, is exposed for a moment to the air, and closed either by adhesive plaster or stitches of silk or silver wire. The opposed surfaces are glazed over by a film of coagulated nutritive fluid exuded from the blood, and this, filling the interspace, agglutinates the walls of the wound and organizes a firm "scar" or cicatrix of fibrous tissue. This scar, if a mere line, may soon disappear by absorption and the part seem again perfect. Such speedy healing is termed "union by first intention" or "primary union." When a wound has been lacerated, or a considerable area of tissue has been removed, the deficit has to be made up by a slower process of new tissue-growth; new cells develop, one by one, in superimposed strata, until the level of the surface is reached, when the skin begins to heal and shoot over the raw area. This is the process of "healing by granulation," far slower than the others, and, if the wound be large, a severe tax upon the strength and health of the patient. In lacerated wounds the more ragged points if left will be destroyed by ulceration or sloughing before the wound can begin to heal, and the delay often converts the wound into a suppurating, weak, and indolent ulcer; therefore, it is better, in cases of ulceration, to remove the irregularities and convert them into incised wounds, either straight or irregular, which can be brought together and heal. When an incised wound has failed of union by "first intention," its walls become granular; they may be approximated, and soon unite, constituting the process of "union by second intention." In the granulation the growth of tissue may become exuberant and rise above the surrounding healing parts on the healthy, intact surface. Such excess of granulation is popularly termed "proud flesh." It must be reduced by use of astringents or compression, or destroyed by caustics, and the site stimulated to a healthier action. Poisoned wounds (see article VENOM) as a rule, should be laid freely open by incision, treated by disinfectant lotions, and the general strength of the patient sustained by diet, tonics, and stimulants. Contusions often call for stimulating lotions, as turpentine and oil, to counteract the shock of the part, and hot cloths to maintain the temperature and restore the circulation when cold. The healing of a wound is facilitated by pure air, regular hours for sleep, plain but rich diet, and abstinence from alcohol. The "antiseptic method" of healing wounds consists in using Lister's spray of carbolic acid or thymol at the time of the incision, or of keeping the parts constantly disinfected by carbolic wash or antiseptic cotton.

Wri'ter's Cramp. See SCRIVENER'S PALSY.

Yel'low Fe'ver, so called because of the peculiar yellow tinge of the skin characterizing it, and for the same reason technically designated *typhus icterode*, *icterus* being the classical name of "yellow jaundice." It is not a form of typhus fever, but resembles it in the prostration, blood-disorganization, and softening of internal organs which are features in both. Yellow fever prevails chiefly in tropical and warm climates. When occurring in temperate or cold zones it has been imported in the course of commercial travel. It is indigenous chiefly in the West Indies, upper coasts of South America, the borders of the Gulf of Mexico, and the Southern U. S. It occurs in isolated, sporadic cases at all seasons in seaports, to which it has been transported in ships. Rigid quarantine of all ships coming from yellow-fever localities, and their fumigation before disembarking passengers and cargo, have averted the epidemics formerly so frequent. It is generally conceded that there is a specific morbid element, a portable *fomites* or fermentative substance, which propagates this disease. This *materies morbi*, when imported and let loose, will prove innocuous unless the weather be warm or mild and the air moist. It rarely develops when the mercury is below 70° F., and frost or freezing weather effectually terminates its career. Insalubrious, damp, low, and filthy localities are more likely to be its points of successful lodgment, as when emigrants from yellow-fever ports, on landing, go to the dense and uncleanly tenement districts of the larger cities. But in the same way it may be carried into the healthiest residences. It is thus the poison is imported and carried directly to certain points which become *foci* of the disease, from which, unless brought under immediate and rigid sanitary surveillance, it radiates with more or less havoc. By the intercourse of business and personal visits it may be carried from the infected localities to other points, which in turn become foci of contagion. But there is no general atmospheric contamination, no infection, no contagion necessarily, except as the air vitiated by the breath, vomit, and stools of the patient is inspired. Yellow fever is not now regarded, as formerly, a fever of malarial origin, allied to intermittent and remittent. It prevails on the coasts and in large cities, sparing the contiguous country, which is often swampy and afflicted severely by malaria. The negroes of the South, although susceptible to malaria, enjoy a relative immunity from yellow fever. Yellow fever has no perio-

dicity—that is, alternations of febrile periods and remissions; from the onset of the attack to its termination it is a continuous fever. Quinine and other antimalarial remedies do not control it, or especially relieve it beyond their general tonic effect. Yellow fever has no definite duration of its period of incubation or formation. In some cases, for two or three days or more, there will be general lassitude, loss of appetite, and sense of debility. In graver cases the attack may be precipitate and speedily fatal; reversely, there are “walking cases,” in which, with jaundice and even mental disturbance, the muscular power is retained. There is usually an initial chill, some headache, and slight increase of temperature. Exceptionally, the thermometer in the mouth or axilla will register a high degree, as in other fevers— 103° , 104° , 105° F.—but more often the body-heat is but little elevated, and in some cases is lowered. The pulse is but little accelerated. The stomach is irritable at an early date, due to the poisonous influence of bile in the blood upon the origin of the pneumogastric nerve, as well as by sympathy with the congested liver. The mind may be mildly or actively delirious. The skin grows yellow, and, when vomiting causes exhaustion and wasting, is often shrivelled. The blood has become seriously impaired by the morbid poison, and its decomposed and watery elements tend to transude the coats of the vessels. Hence, with the effects of vomiting, vessels in the congested stomach are unloaded, and the already disorganized blood, being further perverted by the action of gastric juice, presents a coffee-ground, or again a tar-like, appearance, known as “black vomit.” This is regarded as a critical or even fatal sign; and with reason, since it is an evidence of

serious destruction of red blood-cells. Exhaustion and collapse are the result of such conditions unless stimulating and sustaining treatment is assiduously adhered to. The average duration is a week, and cases vary in character from a mild fever, with gastric disorder, to a malignant and incurable typhus icterode. There is no specific treatment. No depressing remedies should be employed. Cold and evaporating lotions to the head may prevent brain symptoms; ice, effervescing waters or champagne in small quantity, and other remedies for composing the stomach, are valuable. Carbonate of ammonia may help to oxygenate the blood. But “the Spanish method”—quiet, discreet nursing, warm drinks, and blanketing, and, later, abundant nutrition—is found to be the most successful means of cure. The mortality varies with the character of the epidemic, the class of persons it has attacked, their hygienic surroundings, and the discretion with which cases are treated; it may be as low as 5 or as high as 75 per cent.

Zymo'sis. See ZYMOTIC DISEASES.

Zymot'ic Diseases [Gr. *ζυμοω*, to “ferment”], those diseases which, gaining access to the human system, whether by infection or contagion, through a small amount of *materies morbi* or causative germ-matter, thereafter develop or multiply this substance in the blood, each for a definite period of incubation, at the end of which the disease manifests itself. Thus, smallpox has a latent or incubating or formative period of twelve to fourteen days; typhoid fever has a formative period of seven to ten days, measles of eight to twelve days. During these periods of latency, zymosis, or multiplication of the disease-germ in the blood and throughout the body, is thought to progress.



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